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THE

MONTHLY JOURNAL

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MEDICAL SCIENCE.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*On Colchicum Autumnale, chiefly with reference to the Growth of the Plant, and its Physiological and Therapeutic Actions.* By J. McGRIGOR MACLAGAN, M.D., Edin., President of the Royal Medical Society of Edinburgh.—(*Continued from Vol. XIII., p.* 521.)

POISONOUS ACTION ON MAN.

THE following cases of poisoning by the various preparations of COLCHICUM are illustrative of the fact which has been pointed out, that its action in this respect is due more to *acrid* than to *narcotic* properties, inasmuch as the symptoms of the latter, when they appear at all, are generally subsequent to those of the former. In all the cases—*colic, vomiting,* and *purging, slow and almost imperceptible pulse,* and great *prostration of strength,* are represented as having occurred, whilst only in three was there any distinct manifestation of an action upon the *nervous system.* In one case only does the action on the nervous system *precede* the symptoms of acrid poisoning, and in this, *convulsions,* followed by complete *opisthotonos* and *paralysis,* were present. In three cases, the *pupils* were remarked to be *dilated;* in one, *contracted;* in the majority, *suppression of urine* existed; but in one, *diuresis* was present from the time of poisoning to that of death—a period of six weeks.

The post-mortem appearances are in general *redness* and *inflammation* of the intestinal canal; but in the cases mentioned by Chevallier and Caffe, no morbid appearances existed.

The following case, illustrative of the poisonous effects of the *seeds* of COLCHICUM, is narrated by Mr Fereday, of Dudley :[1]—

I.—David Cole, æt. 44, a stout muscular man, feeling pains in his bowels, to which he was subject, on the morning of 8th March, about six o'clock, swallowed, believing it to be rum, about two ounces of wine of the seeds of COLCHICUM.

He immediately discovered his error, but knowing its effects in small doses, conceived it would be followed by vomiting and purging sufficient to avert mischief. He sought no medical aid till four in the afternoon, when he was first seen. He was sitting on a chair, his elbows on his knees. He said that he felt no inconvenience for an hour and a half after taking the dose, when pains in the bowels came on; but that he continued his work until eleven o'clock, when pains in his stomach and bowels, retching, and copious vomiting of a yellowish fluid, compelled him to desist.

Four o'clock p.m.—He describes the pain in the epigastrium as agonising, and says it is like a knife piercing him. The retching is incessant and extremely violent, but no fluid is evacuated; there is tenesmus; a small quantity of fœcal matter has passed. No tenderness on pressure, either in the epigastrium or abdomen. The appearance of the tongue is natural; the pulse small, slow, and feeble; breathing not much affected; the feet cold; his countenance is anxious; features sharp; his cheeks, lips, and palpebræ purple. On attempting to walk, says he thinks he shall lose the use of his limbs.

A mustard emetic was given, followed by copious draughts of warm water and gruel. These were soon returned, with apparently no admixture. Cathartic medicine was given, and immediately returned. Was put to bed; warm bricks were applied to the feet, and hot flannels to the stomach. To take forty drops of laudanum immediately; gruel and coffee plenteously.

Nine o'clock p.m.—The retching, vomiting, and pain in the stomach continue with undiminished violence; the fluid vomited contains a sediment like coffee grounds; he complains greatly of thirst; has made little water. Twenty drops of laudanum every two hours; a blister to the epigastrium; sinapisms to the feet; an enema every hour.

9th March, six o'clock a.m.—Has passed a sleepless night; the symptoms remain unaltered; the eyes are sunk; feet warmer; skin generally natural; no perspiration; pulse scarcely to be felt; respiration hurried; great thirst; no urine. Enemata returned without fœcal matter; camphor, calomel, and opium every three hours; an effervescing draught with brandy every hour.

Eight o'clock p.m.—The retching and pains continued until four o'clock, when the bowels were much distended. Has since had copious liquid stools, dark coloured, and very offensive, and expresses himself better. Makes a few drops only of urine; loses his sight for a minute or two after getting out of bed to the night chair; the pulse is scarcely perceptible, and occasionally intermits; he is perfectly sensible, but talks with effort; calls continually for water. Aromatic confection, carbonate of ammonia, and camphor mixture, with brandy, every hour.

10th March.—In the course of the night his stools passed involuntarily, and in great numbers, his weakness increased, and he died a few minutes before five o'clock this morning, perfectly sensible to the last moment.

Sectio Cadaveris.—The face, neck, upper and front part of the thorax, insides of the arms, front of each forearm, and insides of the thighs, were covered with patches of a purple efflorescence, as were also the integuments of the scrotum and penis. The muscles of the forearm were very rigid, and their fibres contracted into hard knobs. The great omentum, instead of covering the front of the intestines, was turned up between the stomach and convex surface of the

[1] Fereday—London Medical Gazette, vol. x.

liver behind, and the diaphragm in front, from the efforts of vomiting. There was increased redness in a portion of the peritoneum covering the jejunum. The stomach and bowels were coated with a thick, tenacious, but colourless mucus. On a portion of the mucous membrane of the stomach, near the cardiac orifice, and corresponding to its great arch, was a patch of redness, about the size of a half-crown piece ; its secretion here did not vary in tenacity, quantity, or colour, from that of any other portion of the membrane. Upon dividing it at this part, its section presented nothing beyond its usual appearance; there was no pulpiness, no thickening, but a small quantity of blood was effused between it and the muscular coat, giving the reddened internal appearance. Careful examination of that portion of the reddened peritoneum covering the jejunum, demonstrated the like hemorrhagic condition of the blood-vessels. Blood was effused between the peritoneal and muscular coats ; but the mucous membrane corresponding to this portion was perfectly healthy, at least it was perfectly free from inflammation. No other trace of inflammation was observed in other portions of the abdominal viscera. The gall-bladder was distended with healthy bile, the urinary bladder was contracted and empty.

II.—Case of poisoning by a decoction of the *seeds* of COLCHICUM, by Dr Newbrandt.[1]

Caspar B., of Aesthausen, æt. 52, of a sanguine temperament, drank, by mistake, on the night of the 18th February 1830, some of a decoction made with a large spoonful of colchicum seeds and three pints of water ; he had, in the night, more than fifteen stools and vomitings. When Dr Newbrandt saw him next day, he was in a disturbed state. The stools and vomitings were less frequent ; the patient, although weak, did not complain of any pain, and could raise himself ; the abdomen was not distended, and it contracted spasmodically on being touched ; the pulse was small and frequent ; the stools, which were very fœtid, contained small whitish membranes. The patient was made to drink a great quantity of warm water containing butter. This drink provoked vomiting and stools. Immediately after, coffee was ordered, and a strong infusion of marsh-mallow with lemon-juice. Next morning, the 20th, at eight o'clock, the physician found his patient in the following state :—

Face pale ; respiration precipitate ; eyes sunken ; pupils much dilated ; tongue covered with a whitish matter, and could be put out only with difficulty ; region of the stomach rather painful ; breath, face, and extremities cold ; pulse very frequent, scarcely perceptible ; no thirst ; stools more frequent since last evening, and containing matters of a light blue colour. The patient took with pleasure some mucilaginous soups and coffee. Although he replied correctly to questions addressed to him, his intellectual faculties seemed to be confused. Death at ten o'clock.

Sectio Cadaveris, 23 *hours after death*.—Countenance unaltered ; pupils much dilated ; eyes sunken ; the abdomen scarcely more swelled than during life, was of an extraordinary hardness, and showed peculiar stains, more numerous in the cavity of the stomach, and at the sides, towards the back ; they were violet, greenish-blue, not circumscribed. The muscles were of a deep blue when dried in the air. The trachea, towards the bifurcation, was inflamed. The lungs collapsed, small, pale, and soft to the touch, containing much coagulated blood ; on their surface were large black, violet, and brownish spots. The œsophagus was brownish-red at its opening into the stomach. The cardia was of a violet-black colour. The stomach, at its exterior surface, was of a light violet, and much deeper at the interior ; the veins of the stomach and other intestines were greatly distended with perfectly black blood. The liver had a violet tint at its concave surface. The gall-bladder was bulky, and full of green bile. The large and small intestines were hardly inflamed without, and showed

[1] Newbrandt—Medicinisches Correspondenz-Blatt.—The Chemist, vol. i., 1840.

only a few red, brownish spots within. The other organs presented nothing abnormal.

III.—In the same journal as the above, a fatal case of poisoning by the *leaves* of COLCHICUM is mentioned.

IV.—Blumhardt[1] relates a case of poisoning caused by an infusion of a large tablespoonful of the *seeds.*

In three quarters of an hour the man was seized with griping, and then profuse diarrhœa and vomiting. Next morning, twelve hours after the poison was taken, the physician found him still affected with vomiting and purging, but not with pain. He seemed indeed to suffer so little, and to improve so much under the use of emollients, that he was thought to be fairly recovering; but next day the pulse was almost imperceptible; the countenance and extremities were cold; the voice hoarse; the breathing hurried; the eyes sunk; pupils dilated; the epigastrium tender; and the forehead affected with pain. He died at twelve the same day.

V.—M. Ollivier[2] met with two cases of death within twenty-four hours, in consequence of a tincture being taken, which contained the active part of forty-eight grains of the dry *bulb;* and a third case of death in three days, caused by three doses of a watery decoction, made each time with forty-six grains of the bruised *bulb* collected in *July.* Severe purging and prostration followed each dose. There were no symptoms of any affection of the brain.

VI.—A case is mentioned by Chevallier[3] of fatal poisoning from the intentional administration of a vinous infusion of the dry *bulb*, in which death took place in three days, preceded by violent burning in the intestines, great thirst, frequent vomiting of mucus, and intense suffering. The dissection revealed no morbid appearance at all.

VII.—Three American soldiers, who drank by mistake a large quantity of colchicum wine, prepared from the *bulb*, died with symptoms of burning pain, urgent thirst, and frequent vomiting of mucus. One of them, who took eighteen ounces, and died in two days, presented the leading symptoms of malignant cholera,—viz., frequent vomiting; copious rice-water stools; cramps of the abdominal muscles, and flexion of the extremities; coldness of the skin, tongue, and breath; blueness of the nails; dull sunken eyes, contracted pupils, and collapse of the features. The two others had at first similar symptoms, which passed into those of chronic dysentery, and proved fatal in a few weeks.[4]

VIII.—M. Caffe[5] relates the case of a young lady, who, in order to destroy herself, took five ounces of the wine of colchicum. She was soon seized with acute pain in the stomach, then with frequent vomiting; general coldness and paleness; a sense of tightness of the chest, and oppression of breathing; a slow thready pulse, and extreme prostration; and subsequently, with severe and constant cramps in the soles of the feet. In eleven hours she had less frequent efforts to vomit, but was excessively exhausted. In twenty hours the pulse was imperceptible, and in two hours more she died.

There was no suppression of urine; no purging; no diminution of sensibility; no delirium; no convulsions; no change in the state of her pupils.

About a twelvemonth afterwards, her sister destroyed herself by taking the same preparation, of which she took the same quantity, and she died with exactly the same symptoms in twenty-eight hours.[6]

On examination, in neither of these cases was there any inflammation detected.

[1] Blumhardt—Repertorium für die Pharmacie, lxix. Christison on Poisons.
[2] Ollivier—Journal de Chimie Médicale, 1839.
[3] Chevallier—Journal de Chimie Médicale, viii. Second Series. 1832.
[4] Repertorium für die Pharmacie, lxxi.
[5] Caffe—Annales d'Hygiène Publique, xvi.
[6] Annales d'Hygiène Publique, xii.

IX.—Mr Taylor[1] records the case of a gentleman, who, in November 1839, swallowed, by mistake, one ounce and a half of wine of colchicum. He was immediately seized with severe pain in the abdomen, other symptoms of irritation came on, and he died in seven hours. No post-mortem examination was required by the coroner!

In another instance, in which an ounce was taken, death occurred in thirty-nine hours.[2]

Mr Taylor also mentions an interesting case of poisoning by the medicinal administration of colchicum, communicated to him by Mr Mann. Three and a half drachms of the wine of colchicum were taken in divided doses, and caused death on the fourth day. There was no inflammation of the mucous membrane, but simply extravasation of blood into the mucous follicles.[3]

X.—One ounce and a half of the vinous tincture of colchicum was by mistake given one evening to a feeble man, æt. 56, labouring under chronic rheumatism. No complaint was offered for at least one hour after, but then retching came on, with acute pains referred to the stomach, to which vomiting and purging soon supervened. This state continued the whole succeeding night, and a great part of the day following, when the alvine evacuations ceased; but the most distressing nausea continued, with frequent retching. The stools were in the course of the night often involuntary, but not bloody. Excessive thirst came on the day after the accident, and continued till death, with severe pains of the stomach and bowels, which occasioned fomentations to be employed. In the evening the patient seemed nearly exhausted, delirium appeared, the pulse was scarcely perceptible. He lived, however, through the second night, but died the following morning. On dissection, there was no appearance of inflammation of the bowels, but redness of the stomach[4].

XI.—M. Leroy des Barres[5] has reported to the Academy of Medicine the following case of poisoning by Colchicum:—

A female, æt. 57, suffered from pain in the epigastrium. Her medical attendant prescribed for her thirty grammes (an ounce) of tincture of colchicum, of which she was to take a teaspoonful night and morning in a simple julep of taraxacum. Before commencing this treatment, she was directed to take a purgative draught, composed of syrup of buckthorn and sulphate of soda. By some unfortunate mistake, the whole of the colchicum was swallowed instead of this draught. In five minutes she felt severe pain in the stomach and bowels, and there was great anxiety. In this state she was seen by M. des Barres. Her face was pale, the features contracted, and the eyes sunk. The pain in the abdomen was very severe. She vomited once a glairy mucus-like matter, and this was followed by several liquid dark-coloured stools, accompanied by violent colic. The patient complained of a sense of suffocation and strangulation. The pulse was weak, and only fifty in the minute. The extremities were cold, vision was not affected, and the intellect was clear. Small doses of tartar-emetic were administered. These brought away a yellowish-coloured fluid, having a spirituous odour, like that of the tincture of colchicum. Vomiting was promoted by draughts of warm water, and the patient then took the ioduretted water recommended by M. Bouchardât; this appeared to relieve the cramps in the stomach and the colic pains. In about an hour the dose of ioduretted water was repeated. In two hours the patient still continued to suffer from incessant vomiting, with cramps in the muscles of the legs and arms. The extremities were cold, and the lips and arms had a livid hue. Frictions were

[1] Taylor's Medical Jurisprudence, p. 268.
[2] Schneider's Annalen, i., 232.
[3] Taylor—Op. cit.
[4] Edin. Med. and Surg. Journ., vol. xiv.
[5] Leroy des Barres—Gazette Médicale de Paris, 1848.—Journal de Médecine de Bourdeaux, 1848.—Monthly Journal of Medical Science, 1849.—London Medical Gazette, March 1849.

employed, stimulating poultices were applied to the abdomen, and sinapisms to the feet. The patient still continued to take occasional doses of the ioduretted water. Thirteen hours after the poison had been swallowed, the woman was suffering from great prostration of strength, vomiting, diarrhœa, cramps in the limbs, twitchings of the tendons, great agitation, and severe pain in the abdomen; the pulse was 65; only a few drops of urine had been passed. On the following day the symptoms continued, the pulse having risen to 90. The heat of the body was more equally distributed, the tongue was dry, thirst intense, and there was entire suppression of urine. The cramps and convulsive motions of the limbs, with the feeling of strangulation, had disappeared. Leeches were applied to the abdomen, and emollient medicines prescribed. In the afternoon the patient had considerably improved, and urine was freely secreted. On the fifth day the fever had disappeared, but there was still some diarrhœa. In the course of a week or ten days the patient had entirely recovered.

In this case the employment of M. Bouchardât's antidote seems to have been of no use whatever.

XII.—Dr Bleifus[1] has related the following case of poisoning by the *leaves* of COLCHICUM:—

A man gathered the leaves in the beginning of May, and after cooking them, ate about two ounces for supper. In six hours he was seized with violent colic, vomiting, and purging. In fifteen hours, when his physician first saw him, the countenance was ghastly, as in malignant cholera, the pupils dilated, and, scarcely contractile, but the mind entire. He complained of rheumatic pains in the neck, and burning pain in the pit of the stomach. He had frequent vomiting and purging, spasms of the abdominal muscles, coldness of the skin, a small, slow, wiry pulse, cramps of the fingers and calves of the legs. Coffee and lemon juice allayed the vomiting, and a temporary amendment ensued; but early on the third morning he became worse, and soon after the narrator of the case found him dying.

XIII.—The *flowers* are not less poisonous than the leaves, bulbs, and seeds. A case is mentioned in "Geiger's Journal," of poisoning with a decoction of some handfuls of the flowers, where death occurred in twenty four hours, under incessant colic, vomiting, and purging. In this case the stomach and duodenum only were inflamed.[2]

Another case is mentioned by Garibel, of a servant who died from the effects of poisoning by the *flowers*, which were given to cure intermittent fever.[3]

XIV.—The following case of poisoning by the *bulb* of COLCHICUM, taken for the purpose of procuring abortion, is recorded by Mr Dillon.[4]

Susan Laing, was about 30 years of age, and of good health and constitution. She was about two months gone in pregnancy with a bastard child, and having read in a newspaper that a woman had caused abortion by taking meadow saffron, she determined on getting rid of her burthen by a similar measure. She accordingly procured some, and having made an infusion, took it on an empty stomach, early on the morning of the 10th March 1827. Mr Dillon was called to her about four o'clock in the afternoon of the 11th, and on inquiry learnt that she had miscarried the preceding evening. He found her in a very hopeless state, her extremities were quite cold, and the whole of her body, particularly the hands, feet, and face, livid; the expiration was hurried, and the pulse could not be felt at the carotids, and but faintly at the heart. Notwithstanding, the sensorium was undisturbed, and she gave a clear account of what she had done, her motives for so doing, and the effects the poison had on her. She said, that

[1] Bleifus—Repertorium für die Pharmacie, lxix.

[2] Magazin für Pharmacie, xxx.

[3] Garibel—Histoire des Plantes des Environs d'Aix.—Stephenson and Churchill's Medical Botany, vol. ii.

[4] Dillon—Stephenson and Churchill's Medical Botany, vol. ii.—Burnett's Medical Botany, vol. ii.—Beck's Medical Jurisprudence.

in about half an hour after she had taken it, her stomach became sick, griping came on, and a violent purging, which continued with great severity. She had had no medical assistance, and was so tormented with pain and purging, that she had no sleep during the night. Mr Dillon administered large draughts of brandy and spices, but to no effect, as she died two hours after.

The body was opened next day, and all the viscera were found perfectly sound, with the exception, that the mucous membrane of the stomach and bowels were dreadfully inflamed throughout.

XV.—The last case which I shall mention is one recorded by Dr Scilling,[1] in which the effects upon the nervous system are well marked, and *precede* the symptoms characteristic of irritant poisoning. In this case *diuresis* was present from the commencement till the time of death.

A boy, six years old, who, on the 27th June 1836, had eaten of the seeds and leaves of COLCHICUM, was attacked the same night with convulsions, which soon assumed the appearance of opisthotonos. He slept for some time, but soon after another similar attack ensued, and after this had ceased, spontaneous vomiting set in. Tartrate of antimony, ipecacuan, and copper were administered. The patient lay upon his back, and rolled about his head. He passed his urine involuntarily, and his pulse became thready and tremulous. On the 28th and 29th he seemed somewhat recovered. *3d July*.—The elbow and knee joints of the left side swollen, hot, and painful; hemiplegia of right side; perfect loss of hearing; grinding of the teeth and gastricismus. *4th July*.—The right side perfectly paralytic; abatement of the other symptoms. *5th July*.—Convulsion of the whole of the left side; pulse 180. *6th July*.—The patient ate something for the first time; continual diuresis. *18th July*.—Every quarter of an hour a quantity of urine is passed; pulse 180-185, smaller and harder. *24th July*.—Convulsions and loss of feeling on left side; the pulse thready; the breathing has for some days been intermittent. On the night of the *8th August*, the convulsions disappeared; the pulse almost imperceptible. *14th August*.—Violent convulsions, in which, however, the paralytic side did not partake. At three in the morning the patient died. A dissection was not allowed. The diuresis in this case, which began within twenty-four hours after taking the poison, and only ceased at death, is well worthy of observation.

Many other cases of poisoning by COLCHICUM are on record. Too much space, however, has already been occupied in the enumeration of several, the symptoms of which fully establish the fact previously stated, that in general its action is due more to *irritant* than *narcotic* properties; and that when the symptoms of both occur, the *latter* are generally subsequent to the *former*, the only case on record of an action on the nervous system preceding the irritant effects being the one which I have last adduced.

Treatment of Cases of Poisoning.—M. Bouchardât[2] has recommended the use of ioduretted water in such cases. It is a weak preparation of the *Liquor Iodidi Potassii compositus* of the London Pharmacopœia, and is prepared by dissolving six grains of iodide of potassium and three grains of iodine in a pint of water.[3]

Not having been able to procure M. Bouchardât's original paper on the subject, I am ignorant of the principle on which he recommends its use. In the eleventh case of poisoning which I have re-

[1] Scilling—Medizin. Annalen.—Monthly Journal of Medical Science, 1842.
[2] Bouchardât—Gazette Médicale de Paris, Janvier 1837.
[3] London Medical Gazette, 13th April 1849—*Note*.

corded, and in which the ioduretted water was employed, it seems to have been of no use whatever.

The proper treatment in cases of poisoning by COLCHICUM consists in promoting evacuations upwards and downwards to expel the remains of the poison, and then uniting large opiates with counter-irritation of the abdomen, or the application of leeches. (Christison.)

THERAPEUTIC ACTION OF COLCHICUM.

I.—As a *Diuretic*. In 1763, Baron Stoërk,[1] of Vienna, first introduced COLCHICUM as a diuretic; and in a book which he published shortly afterwards, numerous cases cured by the use of COLCHICUM were recorded by him.

He relates two cases of *Dropsy* succeeding to *Scarlatina*, which were completely cured in fourteen days; and a case of *Asthma* and *Ascites* in an old man, both of which diseases were entirely removed in a week. The preparation which he used was the *Oxymel Colchici;* and he directs a drachm to be taken for a dose, this quantity being gradually increased to two ounces daily.

He briefly states the physiological action of COLCHICUM, according to his own observations, in the following sentence:—"It dissolves phlegm, and increases expectoration and urine."

It were needless to occupy space by enumerating more of the cases which were published by Stoërk; but having, in justice to him as the original introducer of COLCHICUM, noticed some of them, I may state, that although considered a great physician, the Baron cannot be regarded as a correct reporter of his own cases; for his contemporary Haen[2] says, that "out of thirty-six cases of cancer reported by Stoërk to have been cured by the use of hemlock, it was found on inquiry, that thirty of them had died, and that the remaining six still laboured under the disease."

Thus, although we can place little reliance upon Stoërk's cases, there can be no doubt, from the subsequent confirmation of experience, that there was good foundation for much that he stated. Notwithstanding the exaggerations imputed to him, Stoërk has at all events the merit of bringing into notice many medicines which have since found places in our pharmacopœias, and which, in many instances, have proved valuable additions to the Materia Medica.

M. Planchon[3] mentions several cases occurring in his practice, in which asthma, hydrothorax, ascites, and anasarca were completely removed by the use of COLCHICUM.

At the present time COLCHICUM, I believe, is little employed as a *diuretic*, as there is hardly any mention of it made in the works of authors of the present day.

[1] Stoërk, de Colchico, 1763.
[2] Haen—Epistola de Cicuta.
[3] Planchon—Journal de Médecine, 1765.

Dr Mason Good[1] says that it is useful in dropsy, and that it ought to rank next to *Squill* as a diuretic in that disease. He exaggerates the acrid properties of the drug, however, in the following passage :—" Even while cutting the roots, the acrid vapour that escapes irritates the nostrils and fauces; and the substance held in the fingers, or applied to the tip of the tongue, so completely exhausts the sensorial power, that a numbness or torpitude is produced in either organ, and continues for a long time afterwards." It is needless to say that there is not the least foundation for such averments.

Dr Craigie,[2] one of the few who mention its use in dropsies, states that it is uncertain in its effects.

That it has diuretic properties, however, is undoubted; and its power of causing increased secretion of urea seems to point it out as a proper stimulant to the kidneys, in cases of suppression of urine, when a fatal result from accumulation of urea in the blood is always to be apprehended.

In the case of a boy, who had almost complete suppression of urine for three days, the whole quantity passed in that time not exceeding an ounce in all, and where digitalis, spiritus etheris nitrici, acetate of potass, and diluents, had produced no effect, Dr Douglas Maclagan used the *Acetum Colchici* with complete success.

" In the acute states of dropsy it is best given with mercurials in powder; but in asthenic cases, it is most advantageously combined with the warmer diuretics, with tonic infusions, with preparations containing camphor or ammonia, or with large doses of the alkaline subcarbonates, particularly in the gouty or rheumatic diathesis." (Copland.)[3]

In *Dropsy* succeeding to *Scarlatina* I have frequently found COLCHICUM of much service, especially in cases where the urine is much suppressed, and where comatose symptoms are present. The accession of *Coma* may easily be ascribed to the accumulation of *Urea* in the blood; and the power which it has been shown that COLCHICUM possesses of replacing the *Urea* in natural, and often superabundant, amount in the urine, seems to point it out as a useful remedy in this and other diseases in which *Suppression of Urine* and *Coma* co-exist. In a case of scarlatina which I attended along with my friend Dr A. Christison, now of the H.E.I.C. Service, and where the urine was totally suppressed, and the symptoms of coma were present, the *Acetic Extract of Colchicum* was used with complete success. Diluents and ordinary diuretics were freely employed when the case was first seen, with the effect of causing a slight secretion of urine

[1] Good—Study of Medicine.
[2] Craigie—Practice of Physic.
[3] Copland—Dictionary of Practical Medicine—*Dropsy*.

of low specific gravity. Having suggested that COLCHICUM might be found of some service, and being anxious to observe its effects, both as a diuretic and as an eliminator of urea, I examined the urine before its exhibition. The results were as follows :—

Urine examined on 10th April.

Total solids, ...		35·795
Urea, ...	2·427	
Uric acid, ...	a trace.	
Inorganic salts, ...	13·510	
Organic matter and water, ...	969·573	
Albumen, ...	14·490	
Total, ...	1000·000	

The *Acetic Extract of Colchicum* was ordered on the 11th April, and the other medicines discontinued. On the 12th, the comatose symptoms were considerably abated; urine, of a normal density, was passed in tolerable quantity, and was examined again on the 13th, two days after the exhibition of Colchicum. It contained :—

Total solids, ...		30·659
Urea, ...	7·500	
Uric acid, ...	0·480	
Inorganic salts, ...	8·718	
Organic matter and water, ...	975·359	
Albumen, ...	7·943	
Total, ...	1000·000	

On the evening of the 14th, the comatose symptoms disappeared; urine, of normal density, was passed in proper quantity ; the dropsical effusion and anasarca completely gone. On the 15th, considerable diarrhœa had set in ; the Colchicum was stopped, and the urine again examined. It contained :—

Total solids, ...		27·972
Urea, ...	13·573	
Uric acid, ...	0·814	
Inorganic salts, ...	7·431	
Organic matter and water, ...	978·182	
Total, ...	1000·000	

The analyses of the urine in this case will show the powerful influence which COLCHICUM possesses in altering the renal secretion, and of how much service, as a remedy, it may be in cases of threatened poisoning by *Urea* in the blood. I believe, in all cases where *Albumen* and *Urea* appear to be vicarious, and where *Coma* supervenes, evidently from the accumulation of the latter principle in the blood, that COLCHICUM will prove to others of as great service as it has already done in the small experience I have had of it.

Two other cases of a similar nature, in which the urine was examined at regular intervals, were treated in the same manner as that which I have related, with precisely the same result.

II.—As a *Sedative.* In 1820, Mr Haden[1] published a small pamphlet upon COLCHICUM, and especially takes notice of its sedative effects on inflammation.

Mr Haden states, "that in pure inflammation, if it be given so as to produce full purgative effects, COLCHICUM will be found to bring the pulse nearly to its natural state, from being either quick, or hard, or slow and full; but this action may also be produced before purging has taken place. Fevers and inflammations so removed never require the use of tonics during convalescence: the patients, indeed, generally appear to be as well as though they had never been the subjects of disease; and although it sometimes happens that a recurrence of symptoms takes place, it is in a much milder degree, and the new disorder is always immediately removed in the course of a few hours by a very little of the same treatment."

Mr Haden found that the *Tincture of Colchicum* often did not produce purgative effects until forty-eight hours had elapsed, and then it was frequently very violent in its action; with the combination of a saline aperient, however, he found that the beneficial sedative effects of Colchicum followed more quickly and were equally decided as when Colchicum was given alone. Having repeatedly found that very violent effects were produced by the *tincture*, he chiefly made use of the *powder* of the *bulbs*, which he extensively employed in a variety of diseases, the principal of which were Acute Rheumatism, Inflammatory Fevers, Inflammation of Lungs, Pleura, and Bronchi, and in Puerperal Fever. He gives numerous cases in which Colchicum was administered in the form of powder, combined generally with a saline aperient.

The following is a case of *Acute Rheumatism* :—

"A stout labourer was suddenly seized with rigors, after working for several hours in the river Derwent; violent fever followed; and the next day he was confined to bed, being incapable of moving his limbs in the slightest degree. Five grains of powdered Colchicum, with a scruple of Sulphate of Potass, were given four times a-day; and two days afterwards he was found walking in the streets, and was soon quite well. Five doses of the medicine were taken."

The next two cases are of *Lumbago*, treated in the same manner :—

"Two patients, about the same age, were unable to rise from their beds, on account of Lumbago. One of them, a gentleman, in addition to taking COLCHICUM, drank plentifully of warm fluids, took the warm bath twice a-day, and kept himself covered by the bed-clothes; he was quite free from pain in twenty-four hours, and was up and quite well in four days;—whilst the other, a lady, although she remained in bed, and the disease left her perfectly well in a week, yet did not use the warm bath, nor any other of the means used by the other patient. In neither of these cases were tonics required."

[1] Haden on Colchicum. 1820.

These last cases do not prove so much in favour of COLCHICUM as in favour of the warm bath and diaphoretic treatment. In the former of the two cases, where these were used along with Colchicum, the relief was rapid, but by no means unusually so; in the latter, where no warm bath was used, the disease lasted longer under the use of Colchicum alone.

It is remarkable that Mr Haden should have been so successful in his use of the powder of the bulb,—a preparation seldom used by other practitioners; but he seems to have employed it, not as being more active, but as being less irregular, than the tincture in its action. His statements, if confirmed, would lead us to esteem it as a remedy of remarkable antiphlogistic powers; but few practitioners are inclined to believe that it will ever supersede the use of the lancet, and other safer antiphlogistic remedies, in cases of pure inflammation.

He gives one case of *Pneumonia*, in which Colchicum was used with perfect success, instead of blood-letting; but nothing appears in his narrative to show that it has any advantage over tartrate of antimony, which is more manageable, and less likely to produce unpleasant effects.

Mr Haden has, towards the end of his work, expressed his opinion of the action of COLCHICUM in the following terms:—"The sensible effects of Colchicum would appear to be, to control the action of the heart and arteries, and indeed often to reduce that action below that of the standard of health. This effect is often produced long before its other sensible effects are apparent; but when continued long enough, and generally before its remedial virtues are decidedly obtained, purging takes place. Sickness and vomiting accompany the purging in some instances, whilst in others the secretion from the kidneys or from the skin is increased, sometimes without the former symptoms being perceived."

We thus find from Mr Haden's observations, that he considered the action of Colchicum essentially sedative, whilst the purgative and diuretic effects were only incidental accompaniments. This statement of the powers of Colchicum as a sedative is certainly over-rated, and its influence in this respect has not been realised to such an extent in the present day.

Dr Copland[1] says, that the kinds of inflammation in which Colchicum may be of essential service are those cases in which a torpid and obstructed state of the liver is present, and then Colchicum, combined with deobstruent purgatives, is of much use. "In cases attended by very acute pain, or by the effusion of fluids from the inflamed part, it will also be of service, when judiciously combined with other means; but its action should be carefully watched, as in some constitutions it produces most depressing and even injurious effects."

[1] Copland—Dictionary of Practical Medicine: *Inflammation—Heart.*

"The sedative influence of Colchicum on the circulation is also shown in cases of preternatural action of the heart, whether from functional or organic causes."

Dr Lewins[1] says,—"In all inflammatory affections of the chest, and perhaps of the brain, or its investing membranes, I am convinced that bleeding may frequently be, to a certain extent, superseded by the use of Colchicum. In many diseases of the heart and large arteries it is a most valuable medicine."

This, however, I believe to be an exaggeration of the extent to which Colchicum is applicable in inflammatory diseases.

In *Fever*. The same author has recorded six cases of Continued Fever, in which COLCHICUM was used with complete success. In all of these considerable physiological action was manifested, such as vomiting, purging, and reduction of the pulse. These, however, are, generally speaking, very unsafe results in fever.

Dr Tait[2] has noticed thirty-five cases of *Scarlatina*, successfully treated with COLCHICUM. In a few cases vomiting was induced, and a considerable quantity of bile evacuated. In most cases diarrhœa followed its use, but the most apparent phenomena were great reduction of the pulse in frequency and force, and subsidence of the palpitation of the heart, which in young subjects was often apparent to the eye. Dr Tait's cases were all of the purely inflammatory type.

Dr Lewins,[3] jun., has seen cases of *Scarlatina* effectually cured by the administration of COLCHICUM. He says,—"In every instance where Colchicum was employed, the malady very speedily proceeded to a very favourable termination; while other cases, apparently similar in their character, in which this medicine was not administered, proved by no means so satisfactory,—several having terminated fatally, and the sequelæ of others being exceedingly troublesome."

III.—As a *Diaphoretic*. COLCHICUM is now never employed merely to produce diaphoresis, although there can be little doubt that its influence in this respect is by no means inconsiderable, sweating being very often mentioned as having supervened in cases which have been treated by COLCHICUM.

When COLCHICUM is used in combination with OPIUM, sweating is frequently produced, and is often copious. The effect here is not to be ascribed solely to the Colchicum, nor is it always proportionate to the dose of Opium, but is probably due partially to both. Probably its good effects in some cases of *Rheumatism* are partially due to this diaphoretic action, and the combination of Colchicum and Opium, appears in many respects to resemble Dover's Powder in its physiological and therapeutic action.

[1] Lewins—Edinburgh Medical and Surgical Journal, xlvii.
[2] Tait—Lancet, 1837-38, vol. i.
[3] R. Lewins—Edin. Med. and Surg. Journal, vol. lvi.

The two diseases in which COLCHICUM is now more generally employed, are GOUT and RHEUMATISM. Its effects in these two diseases have not been decidedly referred to any one of its physiological actions, but have often been considered as being of a specific character. Instead, therefore, of attempting to refer it to any of the above divisions, it will be better to give its action in Gout and Rheumatism a separate consideration.

IV.—In *Gout* and *Rheumatism.* If we are to believe that the *Eau médicinale* has for its basis some preparation of COLCHICUM, we must assign to Dr Jones, of London, the merit of having first employed the drug in this country for the cure of Gout and Rheumatism. On the other hand, if we are to believe that the Eau médicinale does not contain COLCHICUM, to Sir Everard Home this merit belongs, he having been the first to use COLCHICUM in this country under its own proper designation. As I believe, however, that the former of these opinions is the correct one, it demands a notice of the introduction of this nostrum into Britain, and its subsequent use there.

In 1810, Dr Edwin Jones,[1] of London, first introduced the *Eau médicinale* into this country from France; and in a small pamphlet which he published in that year, he relates several cases in which he used the new drug with great benefit. He states the following to be its mode of action:—"In four or five hours after taking the remedy, the patient begins, however severe the paroxysm may be, to experience a diminution of pain; he generally falls into a quiet sleep, and awakes in the morning nearly or quite free from suffering, and often begins to enjoy some returning use of the affected limb; he then commonly feels considerable nausea, sometimes accompanied by vomiting, and generally followed by bilious stools; in the meantime the paroxysm diminishes, and on the third, or even the second day, nothing remains but a slight swelling or stiffness of the parts, which soon goes off, leaving the patient in his usual state of health. These are the common effects," says Dr Jones, "but there are others no less singular and deserving attention. Together with a diminution of pain, there is an abatement of fever and irritation; the pulse is often reduced twenty strokes in a minute, and in many instances considerably more; at the same time a moderate diaphoresis usually takes place. It very frequently also acts as a powerful diuretic, and its operation in this way sometimes lasts for several days."

Though the paroxysm was removed in the majority of his cases in the above manner, Dr Jones observed that the time in which this was effected varied under different circumstances. Sometimes a patient gets rid of a sharp fit the next day; in others, several days may be necessary. "In its action on the bowels, the Eau médi-

[1] Jones on Gout. 1810.

cinale is extremely capricious; it usually operates in the way above-described, sometimes it produces no evacuation at all; in others it proves powerfully emetic and cathartic; and in a few cases has acted with considerable violence." These variations in action did not appear to depend on the relative strength of the patients, as Dr Jones observed that several weak and delicate persons took full doses, without experiencing any disturbance, whilst in some robust habits it acted powerfully both by vomiting and by stool, although only half a dose was taken. This appears rather to be referable to some peculiarity of constitution. It was equally uncertain in the time required to produce these effects. It generally began to operate in eight or ten hours after being taken, sometimes not till twenty-four or forty-eight hours had elapsed, and in some rare cases not till after three days. Dr Jones concludes his remarks on the action of this medicine by stating, that "for the most part the Eau médicinale, even where it has been more violent than was expected, has not been followed by any ill consequences."

In 1815, Mr Want[1] published his conviction of the identity of the basis of the *Eau médicinale* and COLCHICUM. He successively used the menstrua of proof-spirit, wine, and water, and succeeded in forming a preparation with Spanish wine, differing in no respect from the Eau médicinale. I believe Mr Want to have been the first person to draw attention to the probable identity of these two medicines.

The publication of this paper by Mr Want paved the way for a controversy between him and Dr Sutton,[2] the latter of whom very much doubted that Mr Want had discovered the plant whose active properties were the basis of the French nostrum, and he endeavoured to show that Mr Want had only reported cases cured by a medicine well known at the time, and that the power of this remedy merely consisted in its cathartic properties, and stated that many purgatives then known would have the same effect; but Mr Want disproved this in a subsequent paper, in which he published a case of Gout, cured by Colchicum, in which no purging had been induced.

In 1816, Sir Everard Home[3] and Sir Charles Scudamore[4] both wrote upon Gout, the former advocating the identity of the Eau médicinale with Colchicum, the latter denying it. Sir E. Home quotes himself as a case in which the Eau médicinale had acted powerfully and effectually in restraining the gouty paroxysm.

Under the influence of a violent fit of Gout, Sir Everard took sixty drops of the *Eau médicinale.* The pain was intense, and he felt chill; in two hours he became rather hot and thirsty; in three

[1] Want—Medical and Physical Journal, vol. xxxii.
[2] Sutton on Gout.
[3] Home—Philosophical Transactions, 1816-17, Part 2.
[4] Scudamore on Gout and Gravel. 1816.

hours the pain was considerably diminished; in seven hours he had a confirmed motion of the bowels; nausea came on, and the pulse, naturally at 80, lowered to 60, and intermitted. In ten hours the nausea had gone off, he remained languid, his pulse was 70; he had some appetite. The following morning the pulse was 80, and he was quite well.

Sixty drops of the *Vinum Colchici* were given to a man labouring under Gout, and whose paroxysms were generally of three or four weeks' duration. His age was sixty. When the medicine was exhibited, his pulse was 115. In half an hour he had slight nausea, which soon went off. In five hours a profuse perspiration came on, and the pain of the Gout entirely ceased, leaving a soreness in the part affected. In twelve hours his bowels were gently moved, his pulse 105, and irregular. In fourteen hours his bowels were again acted on. In nineteen hours his pulse was 92, and natural. In forty-eight hours he was quite well, and continued so.

From his observations on the use of Colchicum in Gout, Sir Everard Home concluded, that the effects of the remedy always were to reduce the pulse ten or twenty beats in a minute, and that this effect generally took place about twelve hours after the administration of the medicine.

Sir Charles Scudamore denies that the basis of the *Eau médicinale* and COLCHICUM are identical, and he gives his opinion, that the Eau médicinale is a dangerous remedy, and one which has been much too highly praised by Mr Want; he, however, does not deny that it has some influence over Gout, as he states that on the first trial of the medicine the paroxysm is removed, and that as if by a charm, and that relief is often obtained without any sensible effects upon the stomach or excreting organs, and that the curative power of the remedy lessens gradually on repetition, and with many persons becomes entirely lost. The capricious action of this medicine seems to him to be the chief objection to its use. He states a case in which the patient had taken several bottles in a few weeks, without any effect being produced; and another, where the contents of a single bottle so paralysed the stomach, that for many days it was scarcely sensible to the strongest stimulants; the patient was recovered with much difficulty, and remained for a long time in a state of serious debility. He says,—" When the Eau médicinale does not immediately debilitate by the violence of its effects, it often leaves behind an impaired condition of the nervous system, as, that the head is affected with frequent giddiness; the stomach with weakened digestive power, and frequent sensations of sinking and vacuity; the limbs, and especially the parts affected in the paroxysm, suffer for many weeks with trembling, numbness, and coldness, and very commonly with tedious œdema; these symptoms appearing variously in different individuals. It tends also to render the bowels inactive, to diminish the alimentary secretions, and ma-

terially to weaken the functions of the liver. In the general character of the medicine, it may with truth be said, that sooner or later, in proportion as it is freely employed, it leads to a broken state of health."

Mr Ring[1] relates a case of poisoning by the *Eau médicinale*, in a person who had been accustomed to use it for the relief of Gout. Half a bottle was taken; it operated violently as an emetic, cathartic, and sudorific. Next day the Gout had disappeared, but a violent pain had seized the patient in the pit of the stomach; this increased during the night, when it became excessive, alternately affecting the stomach and bowels. On the second day the pain gradually abated; but in the evening bilious vomiting came on; and on the third day he died.

These effects observed in the *Eau médicinale* show it to have been a preparation very analogous to COLCHICUM in its general effects; but its uncertainty and violence correspond more with the accounts which are generally given of the action of *Veratrum Album*, and it is not improbable that it may have contained the active part of both these drugs.

In modern practice, however, the *Eau médicinale* has been completely superseded by the ordinary officinal preparations of Colchicum, and the little bottles in which it was sold are rarely met with, except as preparations in a museum.

There can be no doubt, from the results of modern experience, of the value of COLCHICUM as a remedy in cases of Gout; but, as I have had no opportunity of treating cases of that disease, it cannot be expected that I should offer remarks on the practical employment of any medicine for its cure. I must therefore rest satisfied with briefly reporting the experience of practical men.

1. In *Gout*. It appears probable, that COLCHICUM, in the form of *Hermodactyl*, was employed even in ancient times in the cure of Gout—now it is in very general use.

Its action is very frequently said to be specific, but, as has been previously remarked, this expression seems to imply nothing more than that its effects are energetic and marked; for the term "specific," as applied to a medicine, in strict propriety means one which cures a disease, without producing any distinct or obvious physiological action, in virtue of which it may be supposed to lead to the cure of the disorder; but it appears, from the concurrent testimony of many practical men, that Colchicum seldom cures the paroxysm of Gout, without producing some distinct physiological action. To use the words of Dr Barlow,[2]—" A full dose of this medicine purges copiously, allays pain, and lowers the pulse; its operation seems to

[1] Ring—Edin. Med. and Surg. Journal, vol. vii.
[2] Barlow—Cyclopædia of Practical Medicine—*Gout*.

combine the several advantages of blood-letting, purging, and the production of sedative action."

Dr Christison[1] has stated, that COLCHICUM seldom acts therapeutically before producing a slight degree of that physiological action indicated by diarrhœa, colic pains, and frontal headache, which, in a higher degree, constitutes it a poison.

Dr Gairdner,[2] however, states, that he believes the action of COLCHICUM to be *specific*, and denies the necessity of its producing any physiological effects before relief is obtained. To use his own words,—"COLCHICUM never more effectually relieves the patient than when it acts silently and peacefully, without producing any evacuation whatever, or in any way disturbing the patient's comfort and ease."

The rarity of the occurrence of Gout here has prevented me from deciding, by means of statistics or otherwise, whether or not it is necessary that some physiological action should accompany the therapeutic effect of this drug. I have found means of doing so, however, with regard to Rheumatism, to the results of which inquiry I shall immediately refer.

Dr Robertson[3] states, that while COLCHICUM acts freely on the bowels, and especially on the duodenum, it possesses a specific action on the white fibrous tissues; it is to this property, he says, that COLCHICUM owes its power over Gout, Rheumatism, and certain affections of the heart, and every disease involving febrile or inflammatory excitements, quite independently of its other effects on the system.

Dr Todd[4] states with regard to Gout, what Dr M'Leod[5] does with regard to Rheumatism, that whenever nausea or purging are induced during the administration of Colchicum in those diseases, the dose of the medicine should be diminished, or altogether abandoned.

It has frequently been objected to the use of COLCHICUM, that it confirms the Gouty constitution in the systems of those who have used it. As Gout generally occurs in persons who have the disease confirmed in their constitutions, either by having inherited it, or by having acquired it by full living, &c., Colchicum has got the credit of confirming the Gout in their systems, when that is in reality due to the inherited or acquired Gouty habit.

With regard to this, Dr Holland[6] writes,—"A suspicion has existed that, though capable of relieving the present paroxysm, Colchicum renders the attacks of the disorder more frequent. On my experience, I believe this opinion to be justified only where the

[1] Christison's Dispensatory.
[2] Gairdner on Gout. 1849.
[3] Robertson on Gout.
[4] Todd on Gout and Rheumatism.
[5] M'Leod on Rheumatism.
[6] Holland's Medical Notes and Reflections. 1840.

medicine has been used imperfectly, or without other precautions, which are more or less essential to its success."

On the other hand, Dr Copland[1] says,—"COLCHICUM, when used with the view of preventing or suddenly curing the paroxysm, and without reference to the removal of the morbid condition of which it is the external manifestation, is liable to many objections. The consequences of having frequent recourse to it vary in different constitutions, and with the habits and mode of living of the patient, but they commonly are a much more frequent return of the fit, or of the symptoms indicating its approach; impaired nervous power; debility of the digestive organs; torpor and irregularity of the biliary functions, and of the bowels; headaches, and a variety of symptoms referable to the encephalon." Besides this, he has met with instances of Hypochondriasis, Melancholia, Mental Delusions amounting to Insanity, Paralysis, and Angina Pectoris, evidently arising from this.

Were all physicians agreed upon this point, COLCHICUM would require to be considered in a far different light from that in which it is at present. Few men have met with such untoward results in the use of this medicine as Dr Copland, and we should believe, at least hope, that they are considerably exaggerated.

With regard to the application of COLCHICUM for the relief of the morbid conditions of which Gout consists, besides its use for the mere alleviation or prevention of the paroxysm, Dr Robertson[2] states, that "the action of Colchicum must be said to be more decided and greater on the local manifestation of Gout, and the inflammatory character of its paroxysms, than on the constitutional condition on which Gout depends, and of which the localised ailment is only a form and development."

Dr Holland,[3] however, is more favourable to its further application. He says:—"I can scarcely doubt the expediency of carrying the employment of COLCHICUM beyond the mere relief to the local inflammation of the disease. The remedy, with due care, may be made preventive as well as curative of Gout, and, according to my experience, with no less safety to the patient.

"We may reasonably, then, if this view be just, extend to its use as a medicine the remark before made,—that too exclusive attention is given to the external part of the disease, and the value of the remedy, in the constitutional form of the disorder, too little regarded. Larger experience is making a gradual change in this respect; but there is still a tardiness and timidity in its application beyond the mere fit of Gout, which is not warranted by any ascertained risk."

I offer no further remarks here, both on account of the various opinions of high testimony I have adduced, and also from the fact

[1] Copland—op. cit.: Treatment of Gout.
[2] Robertson—op. cit.
[3] Holland—op. cit.

previously stated, that the rare occurrence of Gout in this place has prevented my making observations on the nature and treatment of the disease.

Besides its actions before stated, COLCHICUM appears to act both as a diuretic and diaphoretic. Its principal action appears, however, to be, lowering the pulse and relieving pain, and therefore its chief object is that of a sedative and anodyne.

Bearing in mind, however, the tendency to the formation of *Lithic Acid* in Gouty subjects, and the effect of Colchicum in altering the renal secretion, it seems more than likely that its effects are partly due to changes which it induces in the chemical quality of the blood, and the secretions derived from it.

All the preparations of COLCHICUM have been employed in Gout and Rheumatism, and have been administered in various ways. Dr Watson[1] recommends forty to sixty minims of the *Vinum Colchici* in a saline draught at bed-time, and a half drachm more in a warm black dose the next morning. More commonly, however, the simple tincture of the seeds is employed. This is recommended by Dr Barlow[2] as being more uniform in strength, and more certain in operation.

It may be administered in full doses (*i. e.*, twenty to thirty minims), and repeated at intervals till the pain has abated, or till some of its physiological actions, such as purging or diuresis, manifest themselves.

2. In *Rheumatism.* COLCHICUM has been employed upon much the same principle as in Gout, and from the similarity of the two diseases we would be led to expect much the same results from its use. It does not appear that its curative powers are in general manifested, until it has fairly produced some of its constitutional effects; and when these are fairly shown, as, for example, when it produces some amount of irritation of the bowels, the disease frequently yields with great rapidity. In Dr Watson's words,—"The preparations of COLCHICUM have sometimes, whether venesection has been premised or not, an almost magical effect in quelling the disease. Frequently when most successful (though that is by no means a necessary condition of their success), they exercise some marked influence upon the stomach and bowels. Colchicum is very apt to occasion deadly nausea and vomiting, griping and diarrhœa, and when these consequences ensue from its use, the inflammation of the joints often subsides entirely. At any rate, if the Rheumatism does not give way, when the stomach and bowels become thus affected, you may be certain that to push the Colchicum further would be useless."

In an interesting memoir, Dr E. Monneret[3] gives the details of

[1] Watson's Practice of Physic. [2] Barlow—op. cit.
[3] Monneret—Archives Générales de Médecine, Mars 1844. London Medical Gazette, vol. xxxiv.

treatment of twenty-five cases of *Articular Rheumatism* treated by COLCHICUM. The greater number of his patients took from one to four drachms of the tincture, in one, two, or four divided doses, in the twenty-four hours. One drachm was the smallest dose of the tincture ever administered, and several of his patients took it for seven, some for ten, and others for thirteen, days. In eight of the patients the diminution, or even total disappearance, of the symptoms of Rheumatism coincided with the exhibition of Colchicum. In these cases, the disease was either of some days' duration, and was scarcely accompanied by febrile symptoms, and then ended in twelve or fourteen days, or it was completely chronic.

In either case, the powerful effects produced by the Colchicum on the bowels sufficed to suspend or expel the disease; the improvement always coincided with the diarrhœa. In most instances, diarrhœa was the prevailing feature, although in some cases retching and vomiting, without any purging, were induced. The discharges were almost always bilious, or evidently mixed with bile. The motions were usually passed with acute suffering, violent colic pains, tenesmus, and scalding of the anus. Vomiting was scarcely induced by a smaller dose of the tincture than from two to four drachms in a draught.

In order to corroborate the idea that COLCHICUM in general produces some physiological effect, before its therapeutical action is manifested, I have prepared the following table of cases of *Rheumatism* treated by Colchicum, in which will be seen the effects of this medicine in seventeen cases.

This must necessarily be more or less imperfect, from the incomplete manner in which the cases have been reported; still it is sufficiently correct to show, that the physiological effects of COLCHICUM are the almost certain accompaniments of its therapeutic action; and it would thus appear that in *Acute Rheumatism*, COLCHICUM produces its good effects, partly by its *evacuant*, and partly by its *sedative* influence.

Beyond this, however, I believe that Colchicum exerts a great influence in the treatment of this disease by the power it has of altering the renal secretion.

In *Acute Rheumatism*, Dr Garrod[1] states, that the blood contains no more *Uric Acid* than in health; this being a very minute quantity. I am inclined to believe, however, that in all cases of *Acute Rheumatism*, both *Urea* and *Uric Acid* are present in the blood in increased quantity.

[1] Garrod—Lond. Med.-Chir. Trans., vol. xxxi.

TABLE OF CASES OF RHEUMATISM TREATED WITH COLCHICUM.

No.	Age.	Sex.	Variety, and parts affected by Rheumatism.	Pulse before treatment.	Previous duration of disease.	Duration of treatment.	Treatment.	Physiological action.	Pulse after treatment.
1	58	M	Articular. Lower extremities.	78	12 Days.[a]	10 Days.	Colchicum Powder.	Diarrhœa, nausea.	Natural
2	40	M	Muscular, and Articular of knees.	60	5 Months.[a]	17 Days.	Colchicum and Dover's Powder.	Griping, nausea.	Natural
3	29	F	Articular. Upper extremities.	—	3 Weeks.[a]	16 Days.	Colchicum Powder.	Diarrhœa. ...	—
4	70	M	Articular.	80	6 Months.[a]	11 Days.	Colch., Morph., Iodid. Potass.	Nausea, diarrhœa.	Natural
5	32	M	Articular.	100	4 Days.[a]	4 Days.	Colchicum, Morphia.	Diarrhœa. ...	65
6	17	F	Articular.	96	14 Days.[a]	2 Months.	Colchicum, Morphia.	Diaphoresis, nausea	80
7	20	F	Articular. Ankles and wrists.	100	8 Days.[a]	4 Days.	Colchicum, Morphia.	Profuse diaphoresis	86
8	22	F	Articular. Knee and wrist.	120	8 Days.[b]	13 Days.	Colchicum, Magnesia. ...	Diarrhœa. ...	60
9	—	M	Articular. Wrists. ...	72	21 Days.[b]	12 Days.	Colchicum, Magnesia. ...	Diarrhœa. ...	54
10	18	M	Articular. All joints, more or less. ...	120	35 Days.[b]	17 Days.	Colchicum, Magnesia. ...	Diarrhœa. ...	60
11	—	F	Articular.	—	4 Months [c]	14 Days.	Vin. Colchici, V.S.	Diarrhœa. ...	—
12	—	M	Articular.	—	49 Days.[c]	14 Days.	Vin. Colchici, Leeches. ...	Diarrhœa. ...	—
13	—	M	Articular.	—	14 Days.[c]	14 Days.	Vin. Colchici, Cupping. ...	Diarrhœa. ...	—
14	—	M	Rheumatic Fever. ...	—	6 Days.[c]	3 Days.	Vin. Colchici, Opium. ...	Diarrhœa. ...	—
15	28	F	Articular. Elbows, wrists, hand. ...	—	3 Months.[d]	14 Days.	Vin. and Acet. Extr. Colchici.	Vomiting. ...	—
16	30	M	Articular. All large joints.	—	12 Days.[e]	6 Days.	Tinct. Colchici.	Profuse diaphoresis	—
17	30	M	Articular, Metastatic. Knees, elbows. ...	130	14 Days.[f]	18 Days.	Tinct. Colchici, Morphia. ...	Diarrhœa, diaphor.	100

[a] From the Journals of Royal Infirmary, Edinburgh.
[b] Tweedie—London Med. Gaz., vol. viii.
[c] Elliotson—London Med. Gaz., vol. viii.
[d] Seymour—London Med. Gaz., vol. xviii.
[e] Dublin Medical Transactions, 1830.
[f] Personal observation.

In the cases which I am about to relate, and which fell under my own observation, I shall endeavour to prove that such is the case, and to show, from the analysis of blood and urine, which I made both before and after the exhibition of Colchicum, that the remedial agency of this medicine is due, partly at least, to its power of eliminating Urea and Uric Acid from the blood, and increasing their quantity in the urine.

The first case was that of a girl, under Dr Wright's care, in the Royal Infirmary. On the 13th of October a small quantity of blood was subtracted, analysed, and found to contain :—

In 1000 parts of blood, ...	0·507 Urea.
" "	·864 Uric Acid.

The urine was examined at the same time. It contained :—

Total Solids, ...		28·568
Water, ...	971·432	
Urea, ...	10·496	
Uric acid, ...	·257	
Inorganic salts, ...	7·461	
Organic matter, ...	10·354	
Total, ...	1000·000	

Colchicum, in combination with Muriate of Morphia, was then administered.

The urine was again examined on the 18th October, being the fifth day. It was found to contain :—

Total solids, ...		31·459
Water, ...	968·541	
Urea, ...	12·312	
Uric acid, ...	·421	
Inorganic salts, ...	8·231	
Organic matter, ...	10·495	
Total, ...	1000·000	

The urine was again examined on the 22d October, or ninth day. It contained :—

Total solids, ...		35·613
Water, ...	964·387	
Urea, ...	13·984	
Uric acid, ...	·598	
Inorganic salts, ...	9·401	
Organic matter, ...	11·630	
Total, ...	1000·000	

After twelve days constant use of the Colchicum, a small quantity of blood was procured for examination. Now, however, not the slightest trace either of Urea or Uric Acid could be detected in so large a quantity as 3500 grains.

The urine was examined at the same time, and was found to contain :—

Total solids, ...		34·554
Water, ...	965·446	
Urea, ...	14·561	
Uric acid, ...	·737	
Inorganic salts, ...	9·649	
Organic matter, ...	9·607	
Total, ...	1000·000	

The Colchicum being still continued, the urine was again examined on the eighteenth day, and found to contain :—

Total solids, ...		38·128
Water ...	961·872	
Urea, ...	17·635	
Uric acid, ...	1·034	
Inorganic salts, ...	9·999	
Organic matter, ...	9·460	
Total, ...	1000·000	

The next case to which I shall refer was treated by myself in the New Town Dispensary. I had only an opportunity of examining the blood in this case once,—namely, before Colchicum was taken. It then contained :—

In 1000 parts, ...	1·416 Urea.
" ...	·691 Uric acid.

Before taking Colchicum, the urine contained :—

Total solids, ...		23·479
Water, ...	976·521	
Urea, ...	6·358	
Uric acid, ...	·097	
Inorganic salts, ...	7·333	
Organic matter, ...	9·691	
Total, ...	1000·000	

The urine was again examined on the fourth, ninth, and thirteenth days respectively, and contained :—

On 4th Day.

Total solids, ...		24·538
Water, ...	975·462	
Urea, ...	9·103	
Uric acid, ...	·231	
Inorganic salts, ...	8·693	
Organic matter, ...	6·511	
Total, ...	1000·000	

On 9th Day.

Total solids,		26·322
Water,	973·678	
Urea,	12·981	
Uric acid,	·497	
Inorganic salts,	9·400	
Organic matter,	3·444	
Total,	1000·000	

On 13th Day.

Total solids,		27·466
Water,	972·534	
Urea,	16·824	
Uric acid,	·936	
Inorganic salts,	7·203	
Organic matter,	2·503	
Total,	1000·000	

These are the analyses of two very favourable cases, in which it will be seen, that the UREA and URIC ACID are increased in proportion to the time that the medicine is continued. I have selected these two cases from many others, on account of their showing the increase more gradually. In all the cases, however, in which I have analysed the urine, the great increase was distinctly marked, although perhaps not in so regular proportion.

One other case I would wish to mention, in which the *Urea* and *Uric Acid*, although they increased after a few days' use of the medicine, did not continue to do so subsequently in the same proportion.

The analyses were made before taking Colchicum, and on the third, sixth, and tenth days after its exhibition :—

Before taking Colchicum.

Total solids,		25·636
Water,	974·364	
Urea,	7·684	
Uric acid,	·129	
Inorganic salts,	8·421	
Organic matter,	9·402	
Total,	1000·000	

On 3d Day.

Total solids,		27·479
Water,	972·521	
Urea,	11·158	
Uric acid,	·300	
Inorganic salts,	8·303	
Organic matter,	7·718	
Total,	1000·000	

On 6th Day.

Total solids, ...		27·907
Water, ...	972·093	
Urea, ...	15·660	
Uric acid, ...	·570	
Inorganic salts, ...	6·500	
Organic matter, ...	5·177	
Total, ...	1000·000	

On 10th Day.

Total solids, ...		28·426
Water, ...	971·574	
Urea, ...	15·730	
Uric acid, ...	·582	
Inorganic salts, ...	7·351	
Organic matter, ...	4·763	
Total, ...	1000·000	

These analyses will show to what extent COLCHICUM will alter the renal secretion, by supplying it, when deficient of its normal constituents—*Urea* and *Uric Acid*—from the blood.

I am inclined from all this to believe, that to this property of Colchicum its remedial action is in a great measure to be referred. Further analyses of the blood may, however, be thought necessary, but neither time nor opportunity have afforded me means for this purpose. The thirteen analyses of the urine recorded above are only a few selected from many others made by me, and were effected according to Becquerel's method.

COLCHICUM has been employed in all forms of the disease, but it appears to me more particularly useful in *Articular Rheumatism*. In Dr Watson's[1] words, "our wishes and our expectations from Colchicum are often doomed to be defeated. I believe that in proportion as the synovial symptoms predominate, or mix themselves distinctly with the fibrous—in proportion as the disease approaches in its characters to Gout—you may expect to be successful with Colchicum. Large doses are not requisite; twenty minims of the *tincture* or the *wine* may be given every six hours, until some relief is obtained; or a grain of the *inspissated juice*, or of the *acetic* extract of Colchicum, every four hours. Under this treatment the disease sometimes vanishes within three or four days; the medicine producing sickness and purging, and the Rheumatism or the Rheumatic Gout rapidly declining. Occasionally the same favourable event takes place, although there has been no disturbance of the stomach and bowels."

The cases in which Colchicum appears to me to be more pre-eminently useful are those in which the disease attacks the joints, and is of an erratic character—*e. g.*, suddenly disappearing from one

[1] Watson—op. cit.

joint, and as suddenly appearing in another; these, I believe, are the cases in which the heart and other internal organs are chiefly affected, and probably if the active operation of Colchicum is secured early, these formidable secondary diseases are less likely to occur.

Of the use of Colchicum topically, little need be said. It is reported to have been employed with great success by Dr Gumpert,[1] who records the case of a clergyman, who had been confined to his bed for six weeks with Rheumatism; on the fifth day, after using frictions with the tincture of the seeds, he was enabled to leave it.

Dr Laycock[2] has likewise used it with great success in Gout, Rheumatism, and also venereal pains.

V.—*Use of Colchicum in other diseases.*

1. In cutaneous diseases.—*Urticaria.*[3] In a case of this disease, where the urine was of low specific gravity (1010), and was found on examination to be much deficient in Urea and Uric Acid, Colchicum was employed with complete success. The urine before taking Colchicum was of a pale straw colour, transparent, and left no deposit on standing. It was analysed according to Becquerel's method, and found to contain :—

Urea, ...	6·91
Uric acid, ...	0·05
Inorganic salts, ...	12·03
Organic matter and water, ...	981·01
	1000·00

Colchicum was then administered, and a fortnight after the urine was again examined. Density 1029·9. It was found to contain :—

Urea, ...	20·36
Uric acid, ...	0·50
Inorganic salts, ...	12·72
Organic matter and water, ...	966·42
	1000·00

Here, then, it will be seen that the physiological action of Colchicum was well marked. The *Urea* was more than tripled in its amount, and raised above the normal standard. The increase of *Uric Acid* was in a tenfold ratio, whilst the other organic constituents and water suffered a corresponding diminution, the inorganic salts remaining nearly as before.

In *Prurigo.*[4] Dr Elliotson gives the case of a man, labouring under this disease in its most inveterate form, to whom half a

1 Gumpert—Revue Médicale—I.
2 Laycock—London Medical Gazette, vols. xxiii., xxiv.
3 Monthly Medical Journal. 1846.
4 Elliotson—Lond. Med.-Chir. Review, vol. vii.

drachm of the Vinum Colchici was administered thrice daily. This the patient took for three weeks; at the end of which time he was completely cured.

Colchicum would thus seem to answer well in some cases of skin diseases where the urine is of low specific gravity.

2. In nervous diseases.—*Hysteria.* Mr Raven[1] details the case of a young woman, who was thrown into strong hysterical convulsions, by seeing the death of a relation. She had been treated by fœtids, volatiles, cathartics, &c., but without relief. She was admitted into hospital under the care of Dr Alderson, who, having lately seen the good effects of Colchicum in severe cases of *Chorea*, was induced to try it on her. Thirty drops of the tincture were taken every eight hours. In a few days the convulsions left her, and did not return. In *Chorea*[2] also Colchicum has been employed with reported benefit. The cases are mentioned of three children having been relieved from this disease in three or four days, by using from ten to twenty minims of the tincture of Colchicum daily.

3. On the *Genito-Urinary System.*—Dr Clutterbuck[3] has seen in Colchicum a peculiar influence over uterine contractions. He administered ten grains of Colchicum in powder to a female in whom the uterus was contracted over the placenta. The dose was repeated, the os uteri dilated, uterine contractions came on, and the placenta was removed in a state of putrefaction.

Dr Metta[4] relates a case of abortion, in which the placenta was retained, and uterine contractions had ceased. Two doses of powdered root of Colchicum, at an interval of half an hour, were prescribed, and soon after uterine contractions came on.

In *Leucorrhœa*, Mr Ritton[5] experienced great benefit from the use of Colchicum in powder. A week or ten days was generally sufficient to complete a cure, the patient being strictly kept from all alcoholic liquors during its exhibition.

In *Gonorrhœa*, Eisenmann,[6] of Berlin, speaks very highly of the results obtained from the use of an opiate wine of Colchicum in this disease. The preparation he uses is composed of three drachms of Colchicum wine and half a drachm of tincture of opium. This is either given in increasing doses, or twenty drops twice daily. The cure is said to be generally complete from the seventh to the fourteenth day.

In *Chordee.*—In a case of *Gonorrhœa*, for which cubebs had been

[1] Raven—London Medical and Physical Journal, vol. xxxvii.

[2] Bibliothèque Médicale, vol. lviii.

[3] Clutterbuck—Mérat et de Lens.—Dictionnaire de Matière Médicale.—Il Filiatre Sebasio, 1843.

[4] Metta—American Journal of the Medical Sciences, vol. viii.

[5] Ritton—Lancet, 1833-34, vol. ii.

[6] Eisenmann—Casper's Wochenschrift, No. xxxv.—Medical Times, 1849.

prescribed, severe chordee supervened. Sir B. Brodie[1] remarked that Colchicum relieved the painful symptoms of chordee better than opium, and had also the effect of restraining sexual desire. He gives a drachm of the wine in one and a half ounces of camphor mixture for a dose.

4. Effects of Colchicum on the *Salivary Glands.*[2] Mention is made of three cases in which profuse ptyalism resulted from the use of *half a drachm* of the tincture of the seeds of Colchicum thrice a-day for some time. In one of these cases, the patient had never been salivated, nor had any mercury ever been taken. They were all cases of ophthalmia.

5. In *Tetanus.*[3] Dr Smith, of Port-au-Prince, employed Colchicum advantageously in tetanus, both traumatic and idiopathic. He gave it in full doses, repeated every half hour, till it produced an emetic or cathartic effect.

6. As an *Anthelmintic* and *Vermifuge.* Dr Pereira[4] states that Chisholm and Baumbach used it successfully in expelling tapeworm; and Mérat et de Lens[5] mention that Bauhin employed it as a vermifuge for pediculi of the head and pubis.

7. As an *Intoxicating agent.*—Chaumeton[6] says that the Turks procure for themselves a kind of ecstatic drunkenness with the Vinum Colchici.

These are merely mentioned as the uses to which Colchicum has been put, as much greater experience than is recorded here would be necessary before we could place much reliance on its power in any of these diseases.

8. In *Cholera Asiatica.*—In 1833, Mr Cotter[7] published a notice of having used Colchicum in Asiatic cholera. His cases are not detailed; and nothing more is remarked, than that he used it with perfect success in all stages of the disease.

No dependence can be placed on statements so vague as this, with regard to the utility of any remedy; nor does it appear easy to understand upon what principles a substance having the physiological action of Colchicum could be expected to be useful, either in the preliminary Diarrhœa or in the stage of Collapse.

The well-known fact, however, that many cholera patients, after having passed from the stage of *Collapse* into that of *Re-action*, continue to be affected with complete *suppression of urine;* that many of these die in a comatose condition, obviously from accumulation of Urea in the blood, naturally point out the employment of *diuretics*, as being indicated in the re-actionary and subsequent stages of

1 Brodie—Lancet, 1838-39, vol. ii.
2 Dublin Hospital Gazette, 1845.—London Medical Gazette, 1845.
3 Smith—Wood and Bache's United States Dispensatory.
4 Pereira—Materia Medica.
5 Mérat et de Lens—Dictionnaire.
6 Chaumeton—Flore Médicale, vol. iii.
7 Cotter—Lancet, 1833-34, vol. ii.

the disease, and the power of Colchicum of eliminating that principle, seems to indicate it as the form of diuretic most applicable to the occasion.

That the non-existence of urea in the urine, and its accumulation in the blood, are at all events pathological conditions of this morbid state, has been abundantly established.

In 1832, Dr O'Shaughnessy[1] published the case of a female, the *serum* of whose blood contained 1·40 per mille of *Urea;* and in 1849, Dr W. Robertson[2] corroborated this fact, by publishing the details of several analyses of blood, taken from the patients in the Cholera Hospital here. In the same year, Dr James Begbie[3] published several analyses of the urine, by which it was distinctly shown that little or no *Urea* is present in that fluid obtained from cholera patients.

During the late epidemic of cholera in this city (1849), I had a favourable opportunity of observing the action of Colchicum as a diuretic in this disease. In the case of a female, in whom a very small quantity of urine, deficient in urea, was voided, the *Acetum Colchici* was prescribed, and its exhibition was followed by the desired effect upon the urine, and with great benefit to the patient. Other cases occurring in the hospital were not so successful, on account of the accession of diarrhœa.

Two great indications in the treatment of this disease being to increase the amount of urine, when that is deficient, which is almost universally the case, and to aid the elaboration of those principles which it is the province of the kidneys to eliminate, the accumulation of which in the blood we may readily suppose to be the cause of the accession of coma, it appears probable that Colchicum might prove of eminent service, and is at all events well worthy of further trial.

9. In *Bright's Disease.*—A consideration of the physiological action of COLCHICUM,—namely, its diuretic action on the kidney, combined with the property of increasing the elimination of Urea, leads me to suggest the probability of its being found useful in some cases of Bright's disease. This I venture to offer as a mere theoretical speculation, which I have had little opportunity of submitting to the test of experience, and which, so far as I can find, has not been adopted in practice by any of the authors who have written on this subject. It is true that Dr Prout[4] mentions the use of Colchicum in this disease, but only where the gouty diathesis is present. Irrespective of this state, I venture to suggest its employment.

The presence of *Urea* in the blood appears to be one of the established phenomena in the advanced stages of Bright's disease.

[1] O'Shaughnessy—Chemical Pathology of Asiatic Cholera, 1832.
[2] W. Robertson—Monthly Medical Journal, 1849.
[3] James W. Begbie on the Urine in Cholera, 1849.
[4] Prout on Stomach and Renal Diseases.

In 1829, Dr Bostock suggested that *Urea* being deficient in the *Urine* of patients labouring under Bright's disease, might be detected in the *Blood.* He accordingly "sought for it in the serosity of several of Dr Bright's patients, but could detect only a matter possessing peculiar properties, which seemed to approach to those of Urea." [1]

In the same year, Dr Christison[2] first detected this principle in the serum of the blood in several cases of Bright's disease. One case which he relates is as follows:—

The urine in this case, although not greater in quantity than natural, contained only a fifth of the normal proportion of *Urea.* The action of nitric acid on the extract of serum produced a beautiful radiated mass of foliaceous pearly crystals of *Nitrate* of *Urea.*

In 1840, Dr G. Owen Rees[3] published a statement of his analyses of the blood of patients labouring under Bright's disease, showing a diminution in the amount of *Albumen,* and an abnormal quantity of *Urea* in the blood.

The following are his analyses:—

(1.) Serum—Sp. gr. 1015—Contained in 1000 grains,—

Albumen,	46·980 grains.
Urea,	0·209 —

(2.) Serum—Sp. gr. 1025—Contained in 1000 grains,—

Water,	904·20
Albumen,	65·00
Extractive and salts,	30·30
Urea,	0·50
	1000·00

(3.) Serum—Sp. gr. 1029, or natural—Contained in 1000 parts,—

Water,	896·6
Albumen,	81·6
Extractive and salts,	21·3
Urea,	0·5
	1000·0

In the first two cases there is a deficiency of *Albumen;* in the last case, although the albumen is normal in quantity, we have morbidly present nearly 0·5 per mille of *Urea,* for in health but a very slight trace of that substance can be detected.

Dr Rees states the largest amount of *Urea* he has found in the blood of Bright's disease is 0·5 per mille, and the smallest 0·209.

Dr Bright[4] states,—"In one very remarkable case, where the

[1] Vide Paper by Dr Christison—Ed. Med. and Surg. Journ., vol. xxxii.
[2] Christison—Op. cit.
[3] Rees—Guy's Hospital Reports, vol. v.
[4] Bright—Guy's Hospital Reports, vol. i., 1836.

albuminous condition of the urine has constantly existed, as far as I know, from frequent experiment, for above three years, the quantity of urea in the blood is very considerable. The results of chemical analysis by Dr Babington were, that the urine did not contain one-third of the *Urea* which it does in health, while about one per cent. of *Albumen* supplied its place. The serum of the blood was remarkably light, in consequence of its deficiency in albumen, having a specific gravity of 1021 instead of 1030; and the quantity of *Albumen* in 1000 grains of serum, amounting, after careful drying, to only 50 grains; whereas from 80 to 100 parts in 1000 is the usual proportion in healthy serum; and it contained fully as much *Urea* as the urine did, the 1000 grains yielding nearly 15 grains of that substance."

The following analyses of the urine in Bright's disease will show the relation which *Urea* and *Albumen* bear to each other and to the other constituents of the urine; but first the analysis of normal urine, as given by Becquerel, must be noticed. Specific gravity 1018·900.

Water,	968·815
Urea,	13·838
Uric acid,	·391
Inorganic salts,	7·695
Organic matter,	9·261
Total,	1000·000

Compare now the following analysis of the urine in Bright's disease (Simon[1]).

	I.	II.
Specific gravity,	1014	1022
Solid constituents,	33·90	66·50
Water,	966·10	933·50
Urea,	4·77	10·10
Uric acid,	0·40	0·60
Fixed salts,	8·04	10·00
Extractive matters,	2·40	—
Albumen,	18·00	33·60

It will be seen that in the first of these the *Urea* is only a third of its normal quantity, *Uric acid* and *Salts* nearly natural, while there is morbidly present four and a half times the amount of *Urea*, of *Albumen*. In the second, the *Albumen* is in the ratio of three to one of *Urea*.

From these statements it will be seen that in Bright's disease the *Albumen* morbidly excreted in the Urine, and the *Urea*, are correlative and vicarious principles. That in the *Blood*, while the *Albumen* is diminished, *Urea* is morbidly retained; and in the *Urine*, while *Urea* is greatly deficient, *Albumen* is morbidly present.

[1] Simon's Chemistry (Syd. Soc. Pub.)

Might we not then reasonably expect that COLCHICUM (acting, as has been stated) would sometimes act as a favourable auxiliary in the treatment of this disease? The cases I have recorded of its use in the dropsy succeeding to scarlatina, would seem to corroborate this view. At all events, when *Ascites* or *Anasarca* are present in Bright's disease as intercurrent affections, the use of Colchicum, both as a cathartic and diuretic, seems to me to be indicated; and in those cases where *Coma* supervenes, from accumulation of urea in the blood, I am confident that it will prove of eminent service.

In the observations contained in the foregoing paper, I have endeavoured to give a correct account of the growth of the COLCHICUM plant; and have offered a suggestion as to the probable cause of the appearance of the abnormal or *adventitious* bulbs which are occasionally observed. From a careful consideration of the growth, chiefly with reference to the medicinal qualities of the bulb at different seasons, I am led to believe that the fittest time for gathering for pharmaceutical purposes is the middle of *July*. In the section devoted to the chemical history of the drug, considerable doubt has been expressed concerning the *crystalline* nature of the alkaloid COLCHICIA; that it differs, however, in many respects from VERATRIA, has been abundantly proved by the experiments of Geiger and Hesse. Considerable space has been occupied by the statement of the physiological effects of Colchicum: and particular attention is directed to the powers which it has, as a sedative, diuretic, diaphoretic, and emetico-cathartic, and to the remarkable property which it possesses of altering the renal secretion. The remainder of the paper is devoted to the therapeutic actions of the drug, particularly as a diuretic in Dropsy, a sedative in Inflammatory diseases, and as possessing a powerful control over the paroxysms of Gout and Rheumatism. An attempt has been made to refer its action in the two latter diseases, in great part at least, to the property it possesses of altering the chemical qualities of the *blood* and *urine;* and to prove, by statistics, that in Rheumatism (and it is believed in Gout also) its beneficial effects are seldom apparent until some of its ordinary physiological actions, such as diuresis, purging, or vomiting, manifest themselves. The use of Colchicum in the Dropsy succeeding to Scarlatina has been mentioned, and a suggestion offered, that its employment might be extended to some cases of Bright's disease, and for the relief of comatose symptoms consequent upon *suppression of urine.*[1]

I take this opportunity of returning my best thanks to Professors Christison and Balfour for the kind assistance which I received from them, while engaged in the foregoing investigations.

[1] An outline of this paper was read before the Royal Medical Society in December 1849.

ARTICLE II.—*A Case of Poisoning by Atropin.* By JAMES ANDREW, M.D. Cantab., F.R.S. & F.R.C.P.E., Physician to the Royal Infirmary, &c.

CASES of poisoning by atropa belladonna are numerous, and many of them of old date; they have generally occurred in consequence of persons eating too many of the berries of this plant, or from an over dose of its leaves, or its extract. But I have been unable to meet with any recorded case of poisoning by the alkaloid atropia; and as a case of the kind has recently come under my own notice, I conceive that I cannot do better than communicate it to the profession generally.

Sarah Jackson, æt. 21 years, was admitted into one of my wards in the Royal Infirmary, on the 1st of August 1851, suffering from an ulcer of the throat, apparently of a mercurial character, and complaining of general debility and loss of appetite. She was treated with alteratives and tonics. Subsequently she had a smart attack of iritis in the right eye, for which she underwent a good deal of antiphlogistic treatment. As she complained of much dimness of vision of the right eye, one drop of a solution, which contained atropin, was directed to be applied to the eye every day, for the purpose of dilating the pupil. By the 20th of October, she was so far well, that I determined to dismiss her in a day or two, but this was not communicated to her. On the morning of the 21st, she awoke between six and seven o'clock, and requested one of the other patients, who had risen from bed, and was at the time going about the ward, to hand her her medicine (meaning thereby a draught of bitters, which she was in the habit of taking every morning); the patient complied, but instead of giving her the draught, she, by mistake, handed her the solution of atropin. Of this, she swallowed a mouthful, and immediately became sensible of a burning feeling in her throat; she remarked to those near her, that a mistake had been made, but that she hoped there was not much wrong, for what was good as an external application, could not surely be very injurious when taken inwardly. A few moments after this remark, she felt her eyesight fail her, at the same time she had a desire to move about, but was prevented, by an overwhelming sensation of a load which oppressed her whole frame; she called to the nurse, but her voice was so feeble that it was only audible to the patient who occupied the adjoining bed; and immediately afterwards she became unconscious of all that was passing around her. The nurse, aware of the accident, immediately gave her large quantities of milk to drink, when she soon commenced to vomit. The clerk, who had been apprised of what had happened, saw her about fifteen minutes after she had swallowed the poison, at which time the pupils were widely dilated, the eyeballs congested and prominent, and she appeared to have no

visual perception of anything about her. The face, generally, was very slightly flushed, the muscles, particularly those of the angles of the mouth, and of the eyelids, frequently twitched and quivered; her pulse was about 130, rather weak. She was very restless, constantly raising herself in bed, and turning her head in different directions. She did not appear, however, disposed to be noisy; for, except when spoken to in a loud tone, she remained quite silent. Occasionally she appeared to smile, and sometimes she laughed quietly. On attempting to get out of bed, she staggered, and would have fallen, had she not been supported. She kept hawking and spitting frequently; and, on being asked, in a loud tone of voice, whether she felt any pain, replied, that she felt a burning in her throat and stomach. The vomiting was kept up by the administration of gr. xxx. of sulphate of zinc, given immediately. About two hours afterwards, when the vomiting had ceased, she became rather drowsy. Two drops of croton oil were then administered, the hair was cut close, cold cloths were applied to the head; and, at the same time, bottles of hot water to the feet, which were very cold. As the drowsiness seemed to be increasing, 40 *minims* of the aromatic spirit of ammonia were given, and the dose was directed to be repeated every half hour, while the drowsiness lasted; a blister was applied to the nape of the neck; and the clerk was instructed, if he observed any greater amount of narcotism, to apply the galvanic battery. This was not required, as she continued much in the same state, until the morning of the 22d. The bowels were very torpid, and three additional *minims* of croton oil only produced one stool. Upon the 22d, she had some shivering in the morning; the drowsiness having passed off, she became rather restless again. By noon she was much agitated, and her manner closely resembled that of a person labouring under delirium tremens; she told me she was a very wicked person, and begged me several times to put her in confinement. The pupils still continued as much dilated, and the eyeballs as congested, and as prominent as before. The face was more flushed than it had been on the previous day, and the twitching of the muscles of the face and hands was still observable. In an hour or two after this, her violence suddenly began to increase, and soon rose to such a degree, that it was found impossible to keep her in bed without having her tied down. To afford some idea of the furious violence with which she was at this time attacked, I may mention that, though a little woman, and by no means muscular, she completely got the better of the two nurses, one of the men-servants of the institution, and two of the clerks, for she succeeded in getting out of bed, in spite of the united efforts of these five persons to keep her in. After being put into a strait jacket, she talked incessantly during the whole of the afternoon, and kept constantly tossing about upon the bed. The pulse was quick, the eyes very much bloodshot, the pupils dilated, and the face still more flushed. She continued to hawk and spit,

and her bowels were moved twelve times during the afternoon and evening. Towards night she became quiet, apparently exhausted by the great efforts she had been making. On the following morning, there was still a good deal of nervous tremor of the eyelids and hands; and when spoken to she started, as if alarmed. Her eyeballs were less prominent, and the pupils not so much dilated. Her face was still flushed; tongue moist, and furred; skin moist, and lower extremities warm. Her pulse was 104, of good strength, and her bowels were still open. *24th October.*—She continues perfectly quiet, and slept during the night. The countenance still a little flushed. The pupil of her left eye is more dilated than the right, and the right eyelid is slightly paralysed. The tongue is clean and not tremulous; the skin moist, and the pulse is 100, soft. During the night and morning of the 25th, she wandered very much in her sleep. She appears more torpid than at the visit yesterday, and when spoken to becomes very much agitated. She complains of burning heat in her feet, which gradually rises to her head, and is succeeded by a sense of cold. The left pupil continues to be much more dilated than the right; and there is a great deal of tremulous motion of the eyelids. She occasionally sees objects double and treble. Sometimes they appear very vivid, at other times dark and obscure. Sometimes she imagines she hears around her the voices of absent friends. The skin is of moderate temperature and moist; the tongue moist, and rather more florid than natural. She complains both of hunger and thirst; her bowels have not been moved for the last forty hours; her pulse is 80, of ordinary strength. She was ordered to take immediately two gamboge pills, made up with one drop of croton oil. These operated freely the following morning. She is still restless at night, and troubled with dreams. When attempting to sit up in bed, she sometimes observes flashes of light, at others dark spots; and, again, at another time, she is affected for a moment with total blindness. She has none of these symptoms while she remains in the recumbent posture; but while lying at rest, she occasionally fancies she sees reptiles creeping along the bed. Her tongue appears natural; but she complains of troublesome thirst, and her abdomen, especially its epigastric portion, is tender on pressure; her bowels are rather loose; her pulse 72, of ordinary character. By the 31st of October she slept well, and was not troubled with spectors, or other illusions; she complained of dizziness, and loss of vision, when she attempted to stoop; her tongue and pulse were natural; her bowels were rather loose. She continued steadily to improve for the next few days, and on the 4th of November was dismissed, cured.

The solution of atropin originally contained two grains of atropin, one drachm of dilute acetic acid, and one and a half ounces of water. On measuring the solution after the accident, seven drachms remained; and as the fourth of a drachm had been used

as collyrium, it follows that the girl must have swallowed between five and six drachms of the solution, or about two-thirds of a grain of atropin. In consulting Dr Christison's work upon poisons, and one or two others, where cases of poisoning by belladonna are recorded, I find that the physical effects of the drug are not very rapidly developed;—thus, according to Dr Christison, "a gentleman, by mistake, once took $1\frac{1}{2}$ drachms of the extract, and half an hour elapsed before it began to produce its physical effects. A second swallowed an infusion of two drachms of dried leaves, and was seized in an hour with great dryness of the throat, followed by other symptoms characteristic of the poison;" and in a case which occurred to Professor Simpson, where the patient used two grains of the extract as a suppository, it was about two hours before any functional disturbance was observed. Whereas in the present case, dryness and heat of the throat and stomach were experienced the instant the poison was swallowed, and though but a very few minutes elapsed before vomiting occurred, yet such were the rapid effects of the alkaloid, that loss of sight, loss of voice, and finally, loss of consciousness, all supervened in less than twenty minutes,—thus proving atropin to be a most active and energetic poison.

ARTICLE III.—*Case of Tracheotomy, followed by Secondary Hemorrhage.* By C. F. SLOAN, M.D., Ayr.

I HAVE been induced to publish the following case of tracheotomy, from the unusual nature of the secondary hemorrhage, both as to its amount and as to the time of its occurrence:—

—— Douglas, aged twenty, had been subject since childhood to attacks of cynanche tonsilaris; at the age of eighteen he became apprentice on board a merchant ship, and shortly thereafter, while suffering from one of his usual attacks, went to sea. At this time, judging from his own account, the parts about the glottis must have become affected, as he then first observed that the act of swallowing excited cough, and that the inspiration became loud and difficult. He then also first remarked a peculiar symptom,—viz., an almost irresistible inclination to fall asleep whenever it blew at all fresh, no matter in what duty he might be engaged. This probably arose from the blood being imperfectly oxygenated.

In March 1850, he gave up a seafaring life, and put himself under treatment, suffering from enlarged tonsils, with symptoms of chronic laryngitis; and in December following was admitted into Glasgow Royal Infirmary. In March 1851 he was dismissed from that institution relieved, and came to reside at Sundrum, about six miles from Ayr. On the afternoon of Saturday, 10th May last, he was brought to me, labouring under a fresh accession of laryngitis. I sent him to a lodging-house in town, ordered

him calomel and leeches, and left directions to be called on the appearance of any marked increase of difficulty of breathing. At half-past two next morning I got a hurried summons, and on arriving found him in the agonies of suffocation. I immediately seated him in a chair, and proceeded to perform tracheotomy, with the assistance of two women, one of whom kept the head of the patient steady, but the other signally failed in her attempt to hold the candle properly, the sight of the first incision having put an end to her usefulness. However, aided partly by the gray light of a summer morning, and partly by feeling, I opened one or two of the rings of the trachea (the precise number I am unable to certify), and introduced a tube. There was only moderate hemorrhage; in a few minutes the patient was breathing freely and tranquilly, and shortly afterwards fell asleep.

The operation was performed at about three A.M., and everything went on most favourably till seven P.M., when, in presence of my friend Dr Craig, I withdrew the tube first introduced, which had become occasionally obstructed, for the purpose of inserting a larger one. This, though done with the greatest care, gave rise to a profuse venous hemorrhage from the upper part of the wound, which, partly passing into the trachea, induced convulsive expiratory efforts, synchronously with which the blood, when the wound was uncovered, poured as if from a vein opened at the bend of the arm. The flow persisted for more than an hour, in spite of pressure applied, by means of lint wrapped round the upper extremity of the tube, and pressed firmly inwards. The only thing that arrested it was the application of the finger to the bleeding vessel, the tube being withdrawn, and the wound of the trachea kept open by a bent probe. Fortunately, Mr Alexander Shaw, surgeon, of Middlesex Hospital, was then on a visit to his friends in Ayr, and on being sent for most promptly rendered his assistance. This gentleman, after giving pressure a fair trial, suggested the employment of the actual cautery, which was applied by means of a heated poker, with immediate and permanent success.

The patient recovered rapidly, without a single bad symptom, and is now in Jamaica, whither he was sent by the kindness of Mr Hamilton, of Sundrum, in the hope that a warm climate might facilitate the cure of his original complaint. When I last heard of him, he was comparatively well; but still wore the tube as a precautionary measure.

It is difficult to estimate the amount of hemorrhage, when diffused over the bedding and floor, but I think the patient could not have lost less than sixteen ounces of blood on this occasion. The point, however, which seems to me most remarkable in the case, is the occurrence of so violent a hemorrhage sixteen hours after the operation, and before ulcerative absorption could have opened any of the vessels.

The actual cautery, as a means of arresting hemorrhage, is per-

haps too much overlooked by surgeons in this country. In any similar instance, I would not hesitate to resort to it even for a moderate oozing, which did not readily yield to pressure.

The perusal of the above case may perhaps afford a useful hint to my country brethren, who are sometimes called upon to operate in circumstances still more unfavourable with regard to assistance than mine in the present instance.

Article IV.—*Contributions to Obstetric Pathology and Practice.* By J. Y. Simpson, M.D., Professor of Midwifery in the University of Edinburgh.

Under the preceding head, I propose to describe occasionally, in the pages of the Journal, such cases of midwifery and the diseases of women and infants, as may happen to be engaging my special attention at the time; or that may appear to me to be of a nature which would prove interesting to my professional brethren. These contributions, however, will be very far from being of the character of attempts at formal essays on the subjects of which they treat. They will generally be practical in their bearing; and consist, for the most part, of the details of one or more passing cases, with a few comments; or of the short discussion of some point in obstetric pathology or obstetric practice.

NO. I.—CHLOROFORM IN INFANTILE CONVULSIONS, AND OTHER SPASMODIC DISEASES.

"There are (observes Dr Churchill [1]), few diseases of infants and children, which are more formidable or more fatal, than convulsions." The great number of deaths from convulsions, especially in infancy, which appears in all our published Mortality returns, so far bears out the justness of Dr Churchill's remark. During the five years from 1838 to 1842 included, there occurred, according to the Registrar-General's official returns, 127,276 deaths from convulsions, in England and Wales.[2] Of these deaths, amounting to about 25,000 annually, almost all are among children below five years of age; and the greatest proportion of cases and deaths takes place among infants during the first year, or rather during the first months or weeks of life.[3]

[1] Diseases of Children, p. 97.

[2] Seventh Annual Report of the Registrar-General, p. 63.

[3] "The frequency of convulsions has, in my practice, appeared most considerable in the first month of life; from this period the disease becomes gradually rarer up to the fifth month, and then again more common up to the period when the incisor teeth make their appearance. After this age, the disease again becomes rare."—See observations of Dr Schœpf Merei, formerly Professor of the Diseases of Children in the University of Pesth, in *Monthly Journal* for 1850, p. 566.

Without entering into the question of the nature of the different types or forms of convulsions observable in early life, I shall content myself, at present, with referring to the general opinion of pathologists, that by far the greatest proportion of infantile convulsive attacks are sympathetic or functional merely;—a predisposition to the disease being laid by an undue excitability, or super-polarity of the cerebro-spinal, or rather "true spinal" or reflex system of Dr Marshall Hall; and the immediate exciting cause of the affection being usually traceable to some morbific irritation of a distant excitant surface or part, as the stomach, bowels, teeth, &c. Hence, when the disease proves fatal under this form, no organic lesions are usually detected. "Dissections (says Dr Merei), have incontestibly established, that in the great majority of cases of infantile convulsions terminating fatally, there is no cerebral or spinal inflammation, nor even evidence of active vascular congestion."[1]

Consequently, in cases of infantile convulsions, particularly when of a sympathetic, reflex, or ec-centric type, after removing all the traceable exciting sources of irritation, and diminishing any excess of vascular action in the nervous centres, physicians have generally proceeded to combat the disease, if it still persisted, with medicinal agents that tended to reduce the super-irritability of the excito-motory system, or otherwise restore it to its proper and healthy standard of action. To fulfil this indication, preparations of zinc, iron, &c., have been used in the more chronic cases; and in the more acute or subacute cases, antispasmodics of very different kinds, as opium, hyoscyamus, musk, &c., have been generally employed. In the following instance, after all the ordinary means of treatment failed, chloroform was used as an antispasmodic with the most marked and satisfactory effect.

CASE.—The Viscountess —— was confined on the 7th October. The child, a boy, kept quite well till the 17th of the same month, when it was observed by its nurse to have, two or three times during the day, twitchings in the muscles of the face; but they were not so severe as to attract any very special attention. During the two following days, these convulsive twitchings were repeated with rather greater frequency; the hands were observed to be clenched during them, and the thumbs were turned inwards.

On Monday the 20th, the convulsions became far more violent in their character, were more prolonged in their duration, and were repeated with much greater frequency. They continued with little change, and no abatement in their intensity or frequency, for the

[1] *Monthly Journal* for 1850, p. 566. See also Rilliet et Barthez's excellent work (Maladies des Enfans), vol. ii. p. 281: North's Practical Observations on Convulsions of Infants, p. 45; Bouchut's Manuel Pratique des Maladies des Nouveaux-Nes, p. 387; &c. &c.

next fourteen days. Sometimes they affected the right side of the body much more severely than the left. In the meantime, Dr Scott and I tried a great variety of means for their relief; but all in vain. The bowels were well acted upon with mercurials, magnesia, &c.; and every separate function attempted to be brought as near as possible to the standard of health. A new wet nurse was procured, lest the milk might perchance have been proving, as it sometimes does, the source of irritation. The child was placed in a larger and better-ventilated room. Ice and iced water were occasionally applied to the scalp. At one time, when the fits became unusually prolonged, and were not only accompanied, but followed for a time, by much congestion in the vessels of the scalp and face, and an elevated state of the anterior fontanelle, two leeches were applied. Liniments of different kinds were used along the spine. Musk, with alkalies, was given perseveringly for several days as an antispasmodic; and small doses of opium, turpentine enemata, &c., were exhibited with the same view. All these and other means, however, proved entirely futile. As I have already stated, it was on Monday the 20th October that the fits first assumed a severe character, and they continued without any amelioration for about fourteen days from that period, recurring sometimes as frequently as ten or twelve times in an hour. At last the child, who had hitherto maintained wonderfully his strength and power of suction, began to show symptoms of debility and sinking; and during the fifteenth and sixteenth days of the attack, the fits became still more violent, and more distressing in their character. They were now accompanied with moans and screams that were very painful to listen to; symptoms of laryngismus and dyspnœa supervened towards the termination of each fit; and in the intervals the respiration, as well as the pulse, continued much quickened.

During these two last days of the disease, the exhaustion became so great, the dyspnœa in the intervals so distressing, and the fits so very violent and constant (seventeen were counted in one hour), that Dr Scott and I gave up all hopes of the possible survival of the infant. We had exhausted all the usual means of relief. Ultimately, but much more with the view of abating the screaming, laryngismus, and other distressing symptons under which the little patient was suffering, than with any great hope of permanent relief and cure, I placed the child, on the forenoon of the 5th November, for about an hour under the influence of the inhalation of chloroform. During this hour there was no recurrence of the fits; but in a short time after the withdrawal of the action of the anæsthetic, the convulsions recommenced with their old violence and frequency. The benefit, however, was sufficient to encourage a longer repetition of the remedy; and from four to eight o'clock in the afternoon of the same day, my assistant, Mr Drummond, placed and kept the child again under the influence of chloroform, a few in-

halations from time to time, of a very small quantity of the drug sprinkled upon a handkerchief, and held before the face of the infant, being sufficient for this purpose. It was specially applied at any threatening of the recurrence of a fit, and during the four hours in question, all convulsions were in this way repressed. When the child was allowed to waken up at eight o'clock, it took the breast greedily, and continued well for upwards of an hour, when the convulsions again began to recur. At last, about twelve o'clock P.M., it was again placed under the inhalation of chloroform, and kept more or less perfectly under its action for upwards of twenty-four continuous hours, with the exception of being allowed to awaken eight or ten times during that period for the purpose of suction and nourishment. During most of this period it was carefully watched by Mr Drummond, and at last the nurse was entrusted with the duty of adding the few drops of chloroform to the handkerchief, and exhibiting them at any time the child was offering to awaken or become restless.

After this long continuation of the chloroform, the child, on being allowed to waken up, as usual drank greedily at the nipple, and immediately fell back into a quiet and apparently natural sleep. The chloroform and all other formal medication was in consequence discontinued; and *from this time there was subsequently no recurrence whatever of the convulsions*. In about ten days the infant was removed with the family to the country. I have, within the last two days (December 18), seen the child as it was passing through Edinburgh. It was strong, plump, and well grown for a child of ten weeks, and was, in fact, revelling in the best of health.

In exhibiting the chloroform to this infant, ten ounces of the drug were expended; but of course a very large proportion of this quantity was lost by evaporation, in consequence of the mode in which it was employed.

I have known the inhalation of chloroform similarly useful in other cases in arresting infantile convulsions; but I am not acquainted with any instance in which the patient was so young as in the above instance. In the adult also, especially in cases of puerperal convulsions, I have now repeatedly seen the inhalation of chloroform as signal and satisfactory in its antispasmodic power over the convulsive fits, as it was in the little patient whose case I have described. Tetanus and epilepsy have been temporarily arrested and controlled by it. And perhaps it will yet be found one of our most certain and beneficial therapeutic means in the functional forms of those different convulsive or spasmodic diseases that are produced either by an undue excitability of the true spinal system, or by distant morbid irritations acting through this—the excito-motory system. Such reflex convulsive or spasmodic affections are, as is well known, particularly common in infancy and childhood. I have seen its use arrest laryngismus, colic, hiccup, &c.; and cases

have been detailed to me of its occasional successful use in asthma, spasmodic urethral stricture, &c. But there is one common and too fatal spasmodic disease, almost confined to the period of childhood, in which I have seen anæsthetic inhalations successful in arresting and controlling the paroxysms, and where probably a more extended and persevering use in the employment of them would be found to be attended with beneficial effects. I allude to hooping-cough. I have known chloroform inhalations greatly abate the irritability of the cough attendant upon phthisis, &c. But with others, I have scrupled to use chloroform inhalations in hooping-cough, under the fear that they might possibly increase the great predisposition which exists in this affection to pneumonic inflammation, or aggravate that inflammation if it were already present. This *a priori* reason, however, against the use of chloroform inhalations as an antispasmodic in hooping-cough has been of late set aside by the observations and experience of different German physicians. In a paper, containing some remarks relative to the medical uses of chloroform, published in the "Monthly Journal" for December 1847, in addition to its employment as antispasmodic, anodyne, &c., I suggested the possibility of the drug acting as a contro-stimulant in some inflammatory diseases, and particularly in those of a painful kind. Latterly, we have had records published of its employment in upwards of 200 cases of pneumonia in German practice. Out of 193 cases of pneumonia treated with chloroform inhalations by Wachern, Baumgärtner, Helbing, and Schmidt, 9 patients died, or the mortality amounted to $4\frac{1}{4}$ per cent. Dr Varrentrapp has given chloroform in 23 cases of pneumonia in the Frankfort Hospital. One of these 23 patients died.[1] The detailed results in the other 22 cases seem to have been sufficiently satisfactory.[2] At all events, the effects of the chloroform inhalations upon

[1] It is proper to add, that during the time that these 23 cases of pneumonia were admitted into the Frankfort Hospital, and treated in that institution with chloroform inhalations, three other cases of the same disease presented themselves, where the patients, at the time of application, were already in a hopeless state. Chloroform was not tried with them.

[2] Out of these 23 cases of pneumonia reported by Varrentrapp, in *addition* to chloroform, the first was treated by venesection and antimony, a second case was bled, and two others that were complicated with pleurisy, had calomel exhibited and blisters applied; the remainder were treated with chloroform alone, about sixty drops being placed upon a piece of cotton, the vapour inhaled for ten or fifteen minutes, and the dose repeated every two, three, or four hours. It was not given so rapidly or strongly as to produce unconsciousness. The patients were all adults; the mean period of the disease at their entrance into the hospital was the fourth day; and the chloroform treatment was usually commenced on the following morning. The effects of the chloroform inhalations seemed generally to be,—1. The induction of perspiration, sometimes after the first inhalation, in no case later than the third or fourth. 2. Gradual diminution and ultimate disappearance of pain in the thorax or side. 3. Relief of the feeling of thoracic tightness. 4. Daily decrease of the frequency of respiration from thirty-seven per minute (the average on admission) down to the natural standard. 5. In all cases, without an exception, the cough was lessened by the inhalation, the inter-

the cough, expectoration, &c., and upon the general course of the disease, would appear to show that we need have no fears of deleterious effects from it, as far as regarded the chance or existence of pulmonary inflammation; whatever advantages we may derive from it in relation to its prevention of that inflammatory state by allaying the cough, keeping the lungs in a relative state of quietude, and abating or restraining the succession of characteristic spasmodic attacks. I speak of course of the more severe cases of pertussis; for the milder forms of it require care merely rather than actual treatment.

NO. II.—OCCASIONAL LATENCY OF THE SYMPTOMS IN ADVANCED CARCINOMA UTERI.

In the earlier stages of cancer of the uterus, the disease is, as a general rule, accompanied by few, or indeed no, well-marked dynamic symptoms. Patients themselves, and sometimes also the members of the profession, seem to expect that the advent and presence of this fatal malady should be very constantly accompanied with local pain and suffering. The reverse, however, of all this seems to be the general rule. In fact, it rarely happens that a patient affected with uterine cancer applies at all for medical advice till the disease has advanced beyond the stage of deposit, and has already made more or less progress in the stage of ulceration. Even then the local symptoms which excite the patient's attention are usually not the expected pathognomonic pain, but occasional attacks of hemorrhage, attended with leucorrhœal discharge. Or, if the pain is present, it often as yet only amounts to a sensation of discomfort and uneasiness, and not to a feeling of actual suffering. Nay, sometimes any feeling of pain in the uterus or uterine region itself never supervenes at all, or not till the very last period of the affection. In the course of practice, I have happened to see a number of cases to which this remark applies. Instances also occasionally occur where the patient suffers more or less severely from pain, but that symptom is in the form of a sympathetic or reflex pain, situated, not in the uterus, but in the limbs, loins, or some other distant part. Several years ago, I had occasion to examine a case in which the cervix uteri was entirely eaten away by extensive cancerous ulceration; but without any marked local pain. The patient, however, had complained so much of pain in the mamma, that local anodyne and other applications had been applied to that

vals between the coughs shortening, the cough itself being less violent, and the expectoration looser; the sputa gradually losing their red tinge, and diminishing in quantity. 6. The pulse fell rapidly in frequency (down to 80 on an average on the fifth day of treatment), and the fever diminished gradually, in one case suddenly. 7. Good and comfortable sleep ensued on an average on the third or fourth day after the commencement of the chloroform inhalations.—See *Henle's Zeitschrift für Rationelle Medicin*, and the *London Medical Times*, for October 18, 1851.

part of the body. Dr Davidson told me the particulars of a case, in which the patient complained to her medical attendant of nothing during life, except a series of severe urinary symptoms, for which she had ineffectually undergone a variety of treatment. On opening her body after death, the coats of the bladder were found deeply implicated in a mass of ulcerated uterine carcinoma. The following case, which I saw within the last few weeks with Dr Cowan, in a patient who came from a distance in the country, is one of the most striking illustrations which I have met with of the occasional latency of the local symptoms of cancer of the uterus, even in a very advanced and ulcerated stage, and of the transference, as it were, of the principal suffering and symptoms to another organ :—

Case.—A lady, æt. 43, married at a very early age, and the mother of six children, had enjoyed the most robust health until twelve months ago. About that period, she first observed a white discharge from the vagina, which she believed to be common leucorrhœa. There likewise occurred repeated discharges of blood; sometimes in large coagulated masses and shreds. At the same time the catamenia recurred with regularity, and without pain. About three months since, she first complained of such prostration as prevented her taking her usual amount of exercise. Difficulty and pain also in passing water, and latterly incontinence of urine, supervened. During all this period, she experienced no feeling of uneasiness referable to the uterus itself, nor were the leucorrhœa or menorrhagia of a nature or extent calculated to excite in the mind of the patient any feelings of alarm. In fact, the principal, and, according to her own account, her almost sole symptoms were the debility already mentioned, and the painful dysuria, which had, however, been relieved by alkalies.

On making a vaginal examination, I found the cervix uteri, with the upper and anterior part of the vagina, the seat of extensive carcinomatous induration and ulceration. The disease in its ulcerative process had, in fact, proceeded so far at one point that it had implicated and *already perforated* the neck of the bladder,—thus leading first to the dysuria, and subsequently to the incontinence of urine, of which the patient so much complained.

In a note from Dr Cowan, dated December 20th, he states :— "At present our patient's appetite is good; bowels regular. She sleeps well, and the general appearance is improved, rather than otherwise, since you saw her. All she complains of is, general debility, incontinence of urine, with a thin white non-acrid discharge, and occasionally (but not constantly) heat in the region of the uterus, unaccompanied with pain. All other symptoms of extensive uterine disease are absent."

ARTICLE V.—*Case of Tic Douleureux Remedied by Operation.* By JAMES B. ALLAN, M.D., Forres.

(Communicated in a Letter to Professor Syme.)

LAST June, a young woman, a domestic servant, aged 25, was brought to me, a perfect martyr from tic, beginning over the right eyebrow, and extending over the face. Her complaint had been of six years' duration, and was gradually becoming more severe, commencing with its characteristic exactness at a certain hour in the morning, and at times changing its hour of visit until night. On feeling the pained eyebrow, the cellular substance on both sides seemed very thick. I detected a hard body, and on cutting down, dislodged a calcareous concretion from its position immediately over the supra-orbital foramen, where it was attached to the nerve. Since its extraction, the girl has been completely free from all pain or uneasiness. May not inveterate *tic* be often caused by similar deposits in inaccessible portions of nervous channels, where they must, of course, elude detection?

FORRES, 2d September 1851.

[The concretion, which accompanied Dr Allan's letter, was of an irregular rounded form, of the size of a large pea, covered with a pellicle of cellular tissue, hard, gritty, unorganised, and consisting entirely of carbonate of lime.]

Part Second.

REVIEWS.

Works of the Cavendish Society. The Life of the Honourable Henry Cavendish, including Abstracts of his more important Scientific Papers, and a Critical Inquiry into the Claims of all the Alleged Discoverers of the Composition of Water. By GEORGE WILSON, M.D., F.R.S.E. London. 1851.

WE fear that the importance of associations like the Cavendish Society is not thoroughly understood by the scientific world, or, at all events, that their full measure of utility is grievously circumscribed by the want of that public patronage which should foster their existence. Although every medical man is presumed to know something of chemistry,—a science indispensable in its relations to the healing art, and ever suggestive of fresh applications,—it is

notorious that when a student is emancipated from the schools, his chemical acquirements are apt soon to subside to a very low level indeed, unless he chance to have the taste and leisure to pursue some analytical investigations, or otherwise specially interest himself in the rapid onward march of chemistry. And as the whole aspect of the science has been for the last fifty years so rapidly changing that its original features are now scarcely to be recognised, while further metamorphosis is all but certain,—as the facts gradually accumulated and theories propounded have become so multiplied and complicated as to tax to the uttermost our powers of memory and of combination,—and as our brethren on the Continent have contributed largely to the science, but in works inaccessible to the majority of English readers, it certainly appears to us that attempts to rescue from oblivion the great points in the history of chemistry, its great men and great works, to systematise and present to us in a useful form the knowledge which successive generations have stored up, and to remove the barriers opposed to its acquisition by the trammels of language, should be favourably viewed by the medical profession. We can cordially recommend the publications of the Cavendish Society to such of our readers as are interested in the progress of chemistry. They will find in Gmelin's Handbook a work of reference probably unrivalled in any language, and now rapidly approaching its completion; in the volume edited by Professor Graham, a series of the most elegant and curious memoirs with which modern philosophy has enriched the science; and in the physiological chemistry of Lehmann, an excellent translation of an original and valuable work upon a branch of chemistry which at the present time is gradually rising in importance.

But of all the volumes which have been hitherto presented to the members of the Society, none has been a more welcome addition to our own library, or will prove more generally acceptable, than the Life and Works of Cavendish by Dr George Wilson. And although every chapter in this volume is replete with interest, we have been more especially charmed with the biographical sketch, which occupies the first 190 pages. The character of the shy, selfish, eccentric, and unimpassioned practical philosopher, is depicted in a style at once admirable and appropriate. All that is known of his extraction, education, and early habits, is comprised in a few pages. The history of his riper years chronicles the order in which his astonishing scientific researches were made, and prepares the reader for the very elaborate vindication of his claims as the original discoverer of the composition of water, which occupies a large portion of the book. His extremely retired habits rendered nugatory any formal attempt to follow the philosopher into the secret paths of his domestic life; yet anecdotes have been collected, chiefly from the reminiscences of his cronies of the Royal Society, or of the select few whom, it is presumed, he met at the Crown and Anchor

or Cat and Bagpipes Clubs,[1] which enable us to form an estimate of his character as a member of society. Indeed, one can hardly look at the quaint portrait of the old bachelor, which, thanks to Mr Tomlinson, faces the title-page of the volume, without indulging in speculations in which the queer old coat and hat, the well-creased black inexpressibles and white stockings, the curious attitude and gait, the furrowed, peevish, and yet highly intellectual countenance, are, like the fair autograph, all suggestive. Let our readers peruse the biography for themselves, and then determine whether the following eloquent sentences by Dr Wilson do not beautifully express their thoughts :—

"I have thus supplied each reader with the means of drawing a likeness for himself, and it only remains that I offer very briefly my own estimate of the character of the philosopher. Morally it was a blank, and can be described only by a series of negations. He did not love ; he did not hate ; he did not hope ; he did not fear ; he did not worship as others do. He separated himself from his fellow men, and apparently from God. There was nothing earnest, enthusiastic, heroic, or chivalrous, in his nature, and as little was there anything mean, grovelling, or ignoble. He was almost passionless. All that needed for its apprehension more than the pure intellect, or required the exercise of fancy, imagination, affection, or faith, was distasteful to Cavendish. An intellectual head thinking, a pair of wonderfully acute eyes observing, and a pair of very skilful hands experimenting or recording, are all that I realise in reading his memorials. His brain seems to have been but a calculating engine ; his eyes inlets of vision, not fountains of tears ; his hands instruments of manipulation, which never trembled with emotion, or were clasped together in adoration, thanksgiving, or despair ; his heart only an anatomical organ, necessary for the circulation of the blood. Yet if such a being, who reversed the maxim, 'nihil humani me alienum puto,' cannot be loved, as little can he be abhorred or despised. He was, in spite of the atrophy or non-development of many of the faculties which are found in those in whom the 'elements are kindly mixed,' as truly a genius as the *mere* poets, painters, and musicians, with small intellects and hearts, and large imaginations, to whom the world is so willing to bend the knee. He is more to be wondered at than blamed. Cavendish did not stand aloof from other men in a proud or supercilious spirit, refusing to count them his fellows. He felt himself separated from them by a great gulf, which neither they nor he could bridge over, and across which it was vain to stretch hands or

[1] "Hoping that some light might be thrown on Cavendish's character by a knowledge of the nature of the last of the clubs referred to, I made inquiry concerning it, and Mr Tomlinson took a great deal of trouble in endeavouring to discover the place of its assembling, and its object. For some time we were entirely at fault ; but at length that valuable journal, *Notes and Queries*, solved the problem so far, probably, as it can now be solved. The Cat and Bagpipes, it appears, was once well known :—'A public-house, of considerable notoriety, with this sign, existed long at the corner of Downing Street, next to King Street. It was also used as a chop-house, and frequented by many of those connected with the public offices in the neighbourhood.'—*Notes and Queries*, Nov. 9, 1850, p. 397. The nature of the Cat and Bagpipes Club, of which Cavendish and Michell were probably members, remains undetermined. One is tempted to imagine, that in the society of some trustworthy, select few, Cavendish may have indulged in a temperate conviviality, and have unbent for some half-hour or so from the indifference which generally characterised him.

"The Crown and Anchor was the tavern at which the Royal Society Club held its meetings."—P. 177.

exchange greetings. A sense of isolation from his brethren made him shrink from their society and avoid their presence; but he did so as one conscious of an infirmity, not boasting of an excellence. He was like a deaf mute sitting apart from a circle, whose looks and gestures show that they are uttering and listening to music and eloquence, in producing or welcoming which he can be no sharer. Wisely, therefore, he dwelt apart, and bidding the world farewell, took the self-imposed vows of a scientific anchorite, and, like the monks of old, shut himself up within his cell. It was a kingdom sufficient for him, and from its narrow window he saw as much of the universe as he cared to see. It had a throne also, and from it he dispensed royal gifts to his brethren. He was one of the unthanked benefactors of his race, who was patiently teaching and serving mankind, whilst they were shrinking from his coldness, or mocking his peculiarities. He could not sing for them a sweet song, or create a 'thing of beauty' which should be 'a joy for ever,' or rouse their hearts, or fire their spirits, or deepen their reverence or their fervour. He was not a poet, a priest, or a prophet, but only a cold, clear Intelligence, raying down pure white light, which brightened everything on which it fell, but warmed nothing,—a star of at least the second, if not of the first, magnitude, in the intellectual firmament.

"His theory of the universe seems to have been, that it consisted *solely* of a multitude of objects which could be weighed, numbered, and measured; and the vocation to which he considered himself called was to weigh, number, and measure as many of these objects as his allotted three-score years and ten would permit. This conviction biased all his doings, alike his great scientific enterprises, and the petty details of his daily life. Πάντα μέτρῳ, καὶ ἀριθμῷ, καὶ σταθμῷ, was his motto, and in the microcosm of his own nature he tried to reflect and repeat the subjection to inflexible rule, and the necessitated harmony which are the appointed conditions of the macrocosm of God's universe. The little peculiarities of his domestic affairs, which might otherwise appear trivialities on which only the spirit of idle gossip could dwell with relish, have for me a much deeper interest, as tokens of a strongly developed will, which gave a singular consistency and unity to all the proceedings of its possessor. Cavendish did all things in the same spirit. He was a hero (to the extent of his heroism) even to his valet-de-chambre. Throughout his long life, he never transgressed the laws under which he seems to have instinctively acted. Whenever we catch sight of him we find him with his measuring-rod and balance, his graduated jar, thermometer, barometer, and table of logarithms; if not in his grasp, at least near at hand. Many of his scientific researches were avowedly *quantitative*. He weighed the Earth; he analysed the Air; he discovered the compound nature of Water; he noted with numerical precision the obscure actions of the ancient element Fire. Each, like some visitor to a strange land, was compelled to submit to a scrutiny in which not only its general features were noticed, but everything pertaining to it, to which a quantitative value could be attached, was set down in figures before it went forth to the scientific world with its passport signed and sealed. The half-mythical calendar of the Hindoos was submitted to the same ordeal, and made to yield consistent numerical results. The electricity of the torpedo; the freezing of mercury; the appearance of an aurora borealis; the hardness of a London pump-water; the properties of carbonic acid and of hydrogen, and much else, were equally subjected to a canon which knew of no limitations, and required that every phenomenon and physical force should be held to be governed by law, and admit of expression in mathematical or arithmetical symbols. It seems, indeed, to have been impossible for Cavendish to investigate any question otherwise than quantitatively. If he is making hydrogen, he tells us how much zinc, or iron, or tin, he took; and what quantity of gas its solution in sulphuric or muriatic acid yielded, although he had no apparent purpose to serve in measuring the volumes of elastic fluid produced. If he plunges a candle into a mixture of nitrogen and air, or carbonic acid and air, he counts carefully the number of seconds during which it burns, and with unwearied patience varies the propor-

tion of the gases. If he is preparing oxygen, he records in his note-book the weight of mercury he took, the quantity of nitric acid in which he dissolved it, the amount of gas which the resultant oxide of mercury yielded, although he need have attended to nothing, except that he had pure oxygen. It would, apparently, have been painful to him to have experimented otherwise. Nor was this all: he insisted on the trivial routine of outward life, following a law as inflexible and imperative as that which rules the motions of the stars. He wore the same dress from year to year, taking no heed of the change in fashions. He calculated the advent of his tailor to make a new suit of clothes as he would have done that of a comet, and consulted the almanac to discover when the artist should appear. He hung up his hat invariably on the same peg, when he went to the meetings of the Royal Society Club. His walking-stick was always placed in one of his boots, and always in the same one. He dispensed charity by a singular numerical rule, not according to the deserts of those for whom assistance was craved, into whose wants he made no inquiry. He settled beforehand the value of a commodity which he wished to purchase, and referred to it as if its worth in money admitted of as precise an arithmetical determination as the combining proportion of a chemical element, or the orbit of a planet. When he rode out in his carriage, he measured the number of miles which he travelled by a *way-wiser* attached to the wheels. He would not take books out of his own library, without giving a receipt for them; nor, indeed, willingly do anything otherwise than in the most simple, uniform, and methodical manner possible.

"Such was he in life, a wonderful piece of intellectual clockwork; and as he lived by rule, he died by it, predicting his death as if it had been the eclipse of some great luminary (which, in truth, it was), and counting the very moment when the shadow of the unseen world should enshroud him in its darkness."—Pp. 185-189.

Lectures on the Physical Diagnosis of the Diseases of the Lungs and Heart. By HERBERT DAVIES, M.D. London: Churchill. 1851.

IN a recent notice of a similar work, by Professor Albers, of Bonn, we remarked that it consisted chiefly of a translation of some lectures by Dr Herbert Davies, originally published in the "Lancet," and expressed our opinion, that the translator had done well in availing himself of their peculiar merits.

We have great pleasure in finding these lectures now published in a more complete and convenient form; and in recommending them to our readers, as the best epitome of the doctrines of the German auscultators, more especially of Skoda and others of the Vienna school, that we have yet met with in the English language.

In the sixteenth lecture, which concludes the work, Dr Davies states some original observations in regard to the production and true significance of venous murmurs. After alluding to the well-known doctrine of Andral, that the venous murmur is invariably present when the per centage of the corpuscular element of the blood falls from the normal standard 127 to 80 per 1000, or lower; and that, conversely, the presence of a venous murmur in the neck is always indicative of such impoverishment of the blood, he proceeds to show that this exclusive view is entirely negatived by a series of observations which he himself conducted upon more than 1000 indivi-

duals of all ages. Thus, of 802 healthy children whose ages varied from fourteen months to fifteen years, there were only 37, *i.e.*, 4·6 per cent., in whom some trace of venous murmur was *not* found on one or other side of the neck; while in 525, or 65·4 per cent., it was loudly audible on both sides. Of 100 *young and healthy men*, belonging to the provisional battalion at Chatham, and the majority of whom presented a ruddy complexion, only 15 were found totally free from venous murmur, while 44 had a loud bruit in both jugulars, and other 30 a more or less distinct murmur in the *right* jugular only. Of 53 healthy females, varying in age from sixteen to twenty-eight, 7 only, or 13·2 per cent., had no murmur. Of 67 aged people of both sexes, 8 only, or about 12 per cent., furnished examples of venous murmurs.

Dr Davies concludes :—

"1. That the venous murmur does not necessarily depend upon any abnormal condition of the blood, nor upon any deviation from the health of the individual in whom it may be found, for we have observed it to be almost universal in children, to be present in a large proportion of persons under the age of twenty-five years, and to exist occasionally in the aged,—all in the most perfect health. It is not, therefore, an anæmic or chlorotic murmur, although uniformly present in those conditions of the system which are marked by an impoverished condition of the blood, inasmuch as it has been observed in a multitude of instances to co-exist with the ruddiest complexion and the most perfect health.

"2. That the venous murmur is not entirely the result of pressure, although some portion of the sound may be fairly attributed to that cause. The existence of a sternal venous murmur at a spot upon which no pressure can be exerted by the stethoscope, is a sufficient proof that sound can originate in the venæ innominatæ, independent of any compressing cause; and if in these veins, why not in the jugulars also? If then, these murmurs can neither be attributed to the transit of thin and impoverished blood through the veins, nor to the effects of external compression upon the parietes of these vessels, in what mode are we to explain their origin? I believe very easily. There can be no doubt that the rapidity of the blood in the large veins is usually sufficient to establish a friction capable of causing a sound which is more or less audible according to the readiness with which the parietes of the veins take up the vibrations, and the facility with which the latter are conducted to the outer surface of the body. The three elements in the production of the murmur in healthy individuals are, therefore,—(1.) A certain velocity of circulation. (2.) An elastic condition of the parietes of the vein. (3.) A good conducting medium between the vein and the surface; the imperfection of any of which will produce a corresponding diminution in the resulting murmur. The sound is of such frequent occurrence in the healthy child, in consequence of the rapidity of its circulation, the thinness of the parietes of the veins, and the elastic nature of the skin and its subjacent structures. The same reasons apply with equal force to the chlorotic girl, whose 'sharp knocking heart' indicates an amount of ventricular contraction sufficient to produce an abnormal velocity in the general current of the circulation. The thin and impoverished condition of the blood, which is an undoubted condition of chlorosis, will also tend to the maintenance of the velocity, and to the production of an unusual friction in the veins. The increase of age brings with it a diminution in the rapidity of the pulse, a thickened or corrugated condition of the parts around the vein, and a probable alteration in the parietes of that vessel, by which its elasticity becomes impaired. To these causes may, perhaps, be added a general diminution in the circulating mass. Hence the unfrequency of the sound after the middle period of life."—Pp. 283-285.

Although objections might be urged against the acceptance of some of these conclusions, the observations on which they are founded seem sufficient to explode Andral's theory of the mutual and exclusive dependence of bruit de diable and chlorosis. It may be necessary to caution those who are inclined to repeat Dr Davies experiments, that they must not expect to find so large a per centage of venous murmurs among the *patients* of an hospital. The subjects of serious pulmonary or cardiac disorders, a very large section of the inmates of an hospital, seldom, if ever, furnish examples of these curious bruits; yet in many such patients the blood is notably impoverished. Theory indeed, confirms what direct experience shows, viz., that in the course of diseases which cause engorgement of the heart, or at least distension of its right cavities with blood, the *bruit de diable* is a phenomenon of exceeding rarity. Hence, in our opinion, its sole value as a sign. In a doubtful case, where the question is between organic disease and mere functional derangement, let this peculiar bruit be distinctly heard over the right jugular vein, and the problem is all but solved,—there is very strong presumptive evidence against the existence of any serious, or at all events structural, lesion of the heart.

Part Third.

CLINICAL REPORTS, LECTURES, ETC.

CLINICAL MEDICINE.—PROFESSOR BENNETT.

REPORT OF THE CASES OF PULMONARY DISEASES TREATED IN THE CLINICAL WARDS OF THE ROYAL INFIRMARY DURING THE LATTER HALF OF THE SUMMER SESSION 1851.—*Continued from the December Number for* 1851.

Condensed from Clinical Lectures.

CASE I.—*Phthisis Pumonalis; Vomica on right side; Slight condensation on left side; Scrofulous caries of right femur; Complete recovery and disappearance of pulmonary physical signs in two years and a half; Incompetence of Aortic Valves.*

History.—Patrick Barclay, æt. 17, was admitted into the clinical ward, July 5, 1851. He was first admitted June 25th, 1849, labouring under cardiac disease, and a large tubercular cavern under the right clavicle. He was emaciated to the last degree, and had profuse sweating, vomiting, dyspnœa, frequent cough, and purulent expectoration, tinged with blood. You will find the particulars of this case in the February No. of the "Monthly Journal" for 1850. By means of cod-liver oil, good diet, appropriate treatment, and counter-irritation, he became stout, and even fat—the cough greatly diminished—the vomiting, nausea, and expectoration ceased, and he believed himself well. But the phy-

sical signs of a dry cavity continued—he had also scrofulous caries of the femur, but was discharged much relieved on the 27th of February 1850.

He was re-admitted August 26th, 1850. Since leaving the house he has been frequently exposed to cold, but has been at the Industrial School,—and latterly the cough and expectoration, which he said had quite left him, have returned, and been gradually getting more severe. The sweating returned with the cough. A week before admission, he, with the other boys of the school, went to Portobello to bathe, and notwithstanding his remonstrances, the master insisted on his going into the water, saying it would do him good. He however became much worse. On admission, the physical signs were coarse moist râle under the right clavicle, imperfect pectoriloquy, and creaking friction noises, harsh inspiration, and prolonged expiration under left clavicle, but the dulness in this position is very slight, when compared with that of the opposite side. He again, by means of cod-liver oil, good diet, and counter-irritation, became strong and stout ; again the cough, expectoration, and other symptoms ceased, and he was discharged March 7th, 1851. The report on that day, is "marked dulness and increased vocal resonance under right clavicle ; the inspiration is harsh but dry."

On admission at present, he says that on leaving the ward in March last, he had two detached pieces of the right thigh bone, extracted by Mr Syme, and remained in the surgical hospital for five weeks. Since then he has been constantly employed in light garden work, and notwithstanding poverty of food, he has continued in tolerably good health till a week ago.

Pulmonary Signs.—On percussion, there is slight dulness only under the right clavicle, and posteriorly the resonance is good and equal on both sides. Under the right clavicle, the inspiration is heard to be harsh and blowing—no moist râle. There is also loud double friction murmur over the upper fourth of right lung, especially at the apex, and slight friction may be detected here and there over the whole of the right side. Under the left clavicle inspiration somewhat exaggerated in tone, but the breath sounds everywhere normal.

Concomitant Symptoms.—He looks pale and thin. There is severe cough, with mucous expectoration, but the appetite is good, and there is on the whole a marked improvement in his general appearance. Impulse of the heart and loud blowing murmur at the base still present. Wound in the thigh nearly healed.

Progress of the Case.—He has continued to do well since his admission into the house. The cough rapidly diminished, and is now only present in the morning on waking. His bodily functions, he says, are in every respect perfectly well performed. The wound in the thigh is cicatrised, and were it not for the cardiac disease, this lad might be considered in robust health. The following is the result of a careful examination of the chest, made December 23, 1851 :—"On percussion, slight dulness under the right clavicle. On auscultation, inspiratory murmur somewhat harsh under both clavicles, but most so on right side. The vocal resonance also is slightly exaggerated over the apex on right side. In every other respect, the lungs appear to be healthy. There is great impulse of the heart still, and over the apex there is heard, with the second sound, a blowing murmur, which is very loud at the base, and double."

Treatment.—Generous diet, milk and cod-liver oil have been given throughout the whole progress of the case, which were taken readily, and speedily, and produced a marked change for the better. In a few months indeed he even became fat. Counter irritation was kept up under the right clavicle from time to time with tartar emetic ointment, and subsequently blisters. Occasionally the oil was suspended, and a chalybeate and vegetable tonic mixture ordered. To relieve the vomiting, naphtha and carminatives, and to lessen the cough, anodynes, expectorants, and demulcents, were found useful.

Commentary.—I am not acquainted with any recorded case which, throughout its progress, has been examined with so much care, in which phthisis in its

last stage was more unequivocally manifested, and which has so decidedly undergone a thorough cure as the one above noticed. The case has been under my observation during thirty months, and during twenty of these months he has been in the clinical ward, repeatedly examined by three winter and two summer classes, as well as by my professorial colleagues. Of the facts, and accuracy of the record in the ward-book, there can be no doubt; and it is equally certain that we have watched the arrest of tubercular condensation at the apex of the left lung, and the cicatrization of a tubercular excavation in the apex of the right lung. Moreover, a careful perusal of the case will show, that this result has not been brought about by the mere spontaneous efforts of nature. On the contrary, great difficulties have had to be surmounted, numerous symptoms removed, and most important complications guarded against. Indeed, the effects of treatment could never be more unequivocally manifested in any case than they have been in this. Before, however, pointing out in detail those symptoms and complications that demand special attention in cases of phthisis, I propose in the first place to make a few observations.

ON THE CURABILITY OF PHTHISIS PULMONALIS.

Up to a very recent period, the general opinion has been, that phthisis pulmonalis almost always marches on to a fatal termination; and that the cases of its arrestment, which were known to have occurred, were so few, as merely to constitute an exception, which proved the rule. Morbid anatomy has now, I think, demonstrated, that tubercles in an early stage, degenerate and become abortive with extreme frequency. In 1845, I made a series of observations with reference to the cretaceous masses and puckering so frequently observed at the apices of the lungs in persons advanced in life. The conclusion arrived at was, that the spontaneous arrestment of tubercle in its early stage occurred in the proportion of from one-third to one-half of all the individuals who die after the age of forty. The observations of Rogée and Boudet, made at the Salpetrière Hospital in Paris, amongst individuals generally above the age of seventy, showed the proportion in such persons to be respectively one-half and four-fifths.

That the cretaceous and calcareous concretions, accompanied with puckerings (examples of which I now show you), are really evidences of abortive tubercles, is established by the following facts :—

1. A form of indurated and circumscribed tubercle is frequently met with, gritty to the feel, which, on being dried, closely resembles cretaceous concretions.

2. These concretions are found exactly in the same situations as tubercle. Thus they are most common in the apex, and in both lungs. They frequently occur in the bronchial, mesenteric, and other lymphatic glands, and in the psoas muscle, or other textures which have been the seat of tubercular depositions, or scrofulous abscesses.

3. When a lung is the seat of tubercular infiltration throughout, whilst recent tubercle occupies the inferior portion, and older tubercle, and perhaps caverns, the superior, the cretaceous and calcareous concretions will be found at the apex.

4. A comparison of the opposite lungs will frequently show, that whilst on one side there is firm encysted tubercle, partly transformed into cretaceous matter, on the other the transformation is perfect, and has occasionally even passed into a calcareous substance of stony hardness.

5. The seat of cicatrices admits of the same exceptions as the seat of tubercles. In one case, I have found the puckering and cicatrix in the inferior lobe only; and have met with three cases, where the inferior lobe was throughout densely infiltrated with tubercle, whilst the superior was only slightly affected.

It has indeed been argued, that occasionally these cretaceous masses may be the result of a simple exudation, or of what Dr Gairdner has called bronchial abscess in the lung. When they are found isolated in the middle or base of

the organ, such certainly may be the case, and consequently the fifth argument may be affected. But this is rare, and can scarcely make any alteration in the vast proportion of those concretions and puckerings which are undoubtedly the result of abortive tubercles. With these facts before us, and with the knowledge that there is nothing in the nature of tubercle itself which is opposed to the evidence of these anatomical facts, the frequent spontaneous cure of tubercle may now be considered established.

Since these observations, however, have become known, it has been stated that after all, practically speaking, phthisis pulmonalis does not mean the existence of a few isolated tubercles scattered through the lung, and that what is really meant is that advanced stage in which the lung is affected with ulceration, and in which the bodily powers are so lowered that perfect recovery seldom or never take place. But here again a careful examination of the records of medicine will show that many even of these advanced cases have recovered. Laennec, Andral, Cruveilhier, Kingston, Pressat, Rogée, Boudet, and others, have published cases where all the functional symptoms and physical signs of the disease, even in its most advanced stage, were present, and yet where the individual survived many years, ultimately died of some other disorder, and on dissection cicatrices and concretions have been found in the lungs.

I here show you a preparation, exhibiting a remarkable cicatrix in the lung, which I described and figured in the "Monthly Journal" for March 1850. As it is short, I may quote it:—

"John Keith, æt. 50, a teacher of languages, was admitted into the Royal Infirmary, February 8, 1844, in a state of coma, and died an hour afterwards. On examination, the membranes of the brain, at the base, were unusually congested, and covered with a considerable exudation of recently coagulated lymph, here and there mingled with bloody extravasation. The apex of the right lung presented a remarkable cicatrix, consisting of dense white fibrous tissue, varying in breadth from one-fourth to three-fourths of an inch, and measuring about three inches in length. The pleural surface in its neighbourhood was considerably puckered. On making a section through the lung, parallel with the external cicatrix, the substance immediately below presented linear indurations, of a black colour, together with five cretaceous concretions, varying in size from a pin's head to that of a large pea. The surrounding pulmonary substance was healthy. The apex of the left lung was also strongly puckered, and contained six or seven cretaceous concretions, each surrounded by a black, dense, fibrous cyst.

"A very respectable-looking and intelligent man, who attended the post-mortem examination, informed me that Keith, in early life, was in very indifferent circumstances, and had supported himself as a writer. At the age of two-and-twenty, or three-and-twenty, he laboured under all the symptoms of a deep decline, and his life was despaired of. About this time, however, he was lost sight of by his friends; but it was afterwards ascertained that he had become a parish schoolmaster, in the west of Scotland, and that his health had been re-established. He returned to Edinburgh six years before his death, and endeavoured to gain a livelihood by teaching Latin and French. He succeeded but very imperfectly, and fell into dissipated habits. Latterly he had become subject to attacks of mania, apparently the result of drink. It was after an unusually severe attack of this kind that he was brought into the Infirmary, where he died in the manner previously described."

The case points out the following important facts,—1st, That at the age of twenty-two or twenty-three the patient had a tubercular ulcer in the right lung, the size of which must have been very considerable when the contracted cicatrix alone was three inches long. 2d. That tubercular exudations existed in the apex of the left lung. It is, therefore, very probable that the statement made by his friend at the examination was correct—namely, that he laboured under all the symptoms of advanced phthisis pulmonalis. It is shown, 3dly, That, after receiving the appointment of a parish schoolmaster, after changing

his residence and occupation, while his social condition was greatly improved, these symptoms disappeared. We may consequently infer, that it was about this period that the excavation on the right side healed and cicatrised, while the tubercular exudations on the left side were converted into cretaceous masses, and so rendered abortive. It demonstrates, 4thly, that when, at a more advanced age, he again fell into bad circumstances, and even became a drunkard, tubercular exudations did not return, but that delirium tremens was induced, with simple exudation on the membranes of the brain, of which he died.

Further, I have conversed with most of the distinguished physicians in this country and on the Continent, and find that they are all enabled to refer to cases, which they are now satisfied have undergone a permanent recovery, even when cavities have existed in the lungs, and all the advanced symptoms of the disease have been present. I once made an effort to accumulate the experience of these distinguished men, on this point alone, and had I done so, it would have constituted an unanswerable amount of evidence as to the curability even of the worst cases of phthisis. Want of time, however, prevented them from writing down the facts. But it is unnecessary to refer you to recorded cases, when the fact stands before you in the case of Barclay. Its comparative frequency, indeed, might be illustrated by such an inquiry, and I believe this to be much greater than is generally supposed; but to the great fact itself, nothing more can be added in the way of evidence than that which is before you; namely, this remarkable cicatrix found in the lung of Keith, and a careful examination of the lad Barclay now in the ward. So deeply rooted, however, has been the opinion of the necessarily fatal nature of this disease, that the generality of practitioners have concluded, that *because* phthisical cases recovered, that the disease was *not* phthisis; that is, they have rather distrusted their own diagnosis than ventured to oppose a dogma of general belief.

But although the fact of the curability of phthisis pulmonalis, even in its most advanced stage, can no longer be denied, it has been argued that this is entirely owing to the operations of nature, and that the physician can lay little claim to the result. Andral, who early admitted the occasional cicatrization of caverns, states this in the following words:—" No fact," he says, " demonstrates that phthisis has been ever cured, for it is not art which operates in the cicatrization of caverns; it can only favour this, at most, by not opposing the operations of nature. For ages remedies have been sought either to combat the disposition to tubercles, or to destroy them when formed, and thus innumerable specifics have been employed and abandoned in turn, and chosen from every class of medicaments."[1] But if it be true, according to Hoffman, that "*Medicus naturæ minister non magister est*," it follows that by carefully observing the operations of nature, learning her method of cure, imitating it as closely as possible, avoiding what she points out to be injurious, and furnishing what she evidently requires, that we may at length arrive at rational indications of cure. Both the cases of Keith and Barclay, in my opinion, furnish evidence that we have in a great measure attained this end; and this leads me to speak, in the second place, of

THE PATHOLOGY AND GENERAL TREATMENT OF PHTHISIS PULMONALIS.

Many observing physicians have not failed to notice, that phthisis pulmonalis is ushered in with a bad and capricious appetite, a furred or morbidly clean tongue, unusual acidity of the stomach and alimentary canal, anorexia, constipation alternating with diarrhœa, and a variety of symptoms denominated dyspeptic, or referable to a deranged state of the primæ viæ. Moreover, it can scarcely be denied that, in the great majority of cases, these are the symptoms which accompany phthisis throughout its progress, becoming more and more violent towards its termination. Now, as the nutritive properties of the blood

[1] Dict. de Med. 1st Edit. Phthisie.

are entirely dependent on a proper assimilation of food, and as this assimilation must be interfered with in the morbid conditions of the alimentary canal, the continuance of such conditions necessarily induces an impoverished state of that fluid, and imperfect growth of the tissues. Moreover, when, under such circumstances, exudations occur, it has been shown by the histologist that they do not exhibit any tendency to perfect cell formations, but that corpuscles are produced, which form slowly, and slowly break down, causing softening, and the production of ulceration, which becomes more and more extensive as the amount of the exudation increases.

An observation of the circumstances which precede the disease, or its so-called causes, clearly indicate imperfect digestion and assimilation as its true origin. Thus phthisis is essentially a disorder of childhood and youth—that is, a period of life when nutrition is directed to building up the tissues of the body. Diminish the proper quantity of food taken by a healthy man, tubercular diseases are not induced ; but if this be attempted with children or young persons, they are a most common result. It has been supposed that hereditary predisposition, a vitiated atmosphere, changeable temperature, certain occupations, humidity, particular localities, absence of light, and so on, predispose to phthisis. Very frequently several of these are found united, so that it is difficult to ascertain the influence of each. When they so operate, however, they invariably produce, in the first place, more or less disorder of the nutritive functions, and are associated with dyspepsia, or other signs of mal-assimilation of food.

From a study of the symptoms, causes, morbid anatomy, and histology of phthisis pulmonalis, we are therefore led to the conclusion, that it is a disease of the primary digestion, causing,—1st, impoverishment of the blood ; 2d, local exudations into the lung, which present the characters of tubercular exudation ; and, 3d, owing to the successive formation and softening of these, and the ulcerations which follow in the pulmonary or other tissues, the destructive results which distinguish it. Further observation shows, that circumstances which remove the mal-assimilation of food frequently check further tubercular exudations, while those which previously existed become abortive, and that occasionally more extensive excavations in the pulmonary tissue may, owing to like circumstances, heal up and cicatrize.

A healthy nutrition of the body cannot proceed without a proper admixture of albuminous and oleaginous elements. This may be inferred from the physiological experiments of Tiedemann and Gmelin, Leuret and Lassaigne, Magendie, and others ; from an observation of the constituents of milk, the natural food of young mammiferous animals ; from a knowledge of the contents of the egg, which constitute the source from which the tissues of oviparous animals are formed before the shell is broken ; and from all that we know of the principles contained in the food of adult animals. The researches of chemists, such as those of Prout, Liebig, and others, point to the same generalisation, when they assert that carbonised and nitrogenised, or, as they are now called, respiratory and sanguigenous food, are necessary to carry on nutrition, inasmuch as oil is a type of the one, and albumen of the other. The chemical theory is imperfect, however, because it does not point *how* these elements form the tissues ; for it is not every form of carbonised or of albuminous food that is nutritious, but only such kinds of them as are convertible into oil and albumen.

The reason of this was first pointed out by Dr Ascherson of Berlin, in 1840, and made known by me to the profession in this country in 1841. I have since endeavoured to show that the elementary molecules formed of a particle of oil, surrounded by a layer of albumen, which are produced, as he described, by rubbing oil and albumen together, are not developed directly into blood-globules and other tissues, as he supposed, but must first pass through a series of transformations,—a knowledge of which is highly important, not only to a comprehension of nutrition generally, but especially to that anormal condition

of it which occurs in phthisis. Thus the successive changes which occur for the purposes of assimilation in the healthy economy may be shortly enumerated as follows :—1st. Introduction into the stomach and alimentary canal of organic matter. 2d. Its transformation by the process of digestion into albuminous and oily compounds : this process is chemical. 3. The imbibition of these through the mucous membrane in a fluid state, and their union in the termini of the villi and lacteals to form elementary granules and nuclei : this process is physical. 4th. The transformation of these, first, into chyle corpuscles, and, secondly, into those of blood : which is a vital process. It is from this fluid, still further elaborated in numerous ways, that the nutritive materials of the tissues are derived, so that it must be evident, if the first steps of the process are improperly performed, the subsequent ones must also be interfered with. Hence we can readily comprehend how an improper quantity or quality of food, by diminishing the number of the elementary nutritive molecules, must impede nutrition.

The peculiarity of phthisis, however, is, that an excess of acidity exists in the alimentary canal, whereby the albuminous constituents of the food are rendered easily soluble, whilst the alkaline secretions of the saliva and of the pancreatic juice, are more than neutralized, and rendered incapable either of transforming the carbonaceous constituents of vegetable food into oil, or of so preparing fatty matters introduced into the system, as will render them easily assimilable. In consequence, more albuminous than fatty matters enter the blood, and the necessary waste of structure is supplied by the absorption of the adipose tissues of the body. Hence the emaciation which characterises the disease. In the meanwhile, the lungs become especially liable to local congestions, leading to exudation of an albuminous kind : which is tubercle. This, in its turn, being deficient in the necessary proportion of fatty matter, elementary molecules are not formed so as to constitute nuclei capable of further development into cells,—they therefore remain abortive, and constitute tubercle corpuscles. Thus the local disease is added to the constitutional disorder, and that compound affection is induced, which we call phthisis pulmonalis—consisting of symptoms attributable partly to the alimentary canal, and partly to the pulmonary organs.

To improve the faulty nutrition which originates and keeps up the disease, it is of all things important, therefore, to cause a larger quantity of fatty matter to be assimilated. A mere increase in the amount, or even quality, of the food, will often accomplish this, as in the case of Keith. The treatment practised, some years ago, by Dr Stewart, of Erskine, which consisted in freely administering beef-steaks and porter, and causing exercise to be taken in the open air, excited considerable attention from its success. I have been informed, that in some parts of America the cure consists in living on the bone marrow of the buffalo, and that the consumptive patient gets so strong in this way, that he is at length able to hunt down the animal on the prairies. All kinds of food rich in fat, will not unfrequently produce the same effects, and hence the value long attributed to milk, especially ass's milk—the produce of the dairy, as cream and butter, fat bacon, caviar, &c.

But, in order that such substances should be digested and assimilated, the powers of the stomach and alimentary canal must not have undergone any great diminution. In most cases it will be found that the patient is unable to tolerate such kind of food, and that it either lies undigested in the stomach, or is sooner or later vomited. Under these circumstances, the animal oils themselves are directly indicated, by giving which, we save the digestive apparatus, as it were, the trouble of manufacturing or separating them from the food. By giving considerable quantities of oil directly, a large proportion of it is at once assimilated, and is rendered capable of entering into combination with the albumen, and thereby forming those elementary molecules so necessary for the formation of a healthy chyle. Such, it appears to me, is the rationalé of the good effects of cod-liver oil.

Since I introduced this substance to the notice of the profession as a remedy for phthisis, in 1841, I have continually prescribed it in hospital, dispensary, and private practice. I need not, perhaps, say, that I have given it in a very large number of cases, and have observed its effects in all the stages of the disease, and under almost every circumstance of age, sex, and condition. I have had the most extensive opportunities of examining the bodies of those who have died after taking it in considerable quantities, and am still observing the cases of many persons who may be said to have owed their lives to its employment. Further, I have carefully watched the progress it has made in the good opinion of the professional public, and perused all that has been published regarding it in the literature of this and other countries. It were certainly easy for me, therefore, to write at great length on this subject; but I do not see that anything of utility could be added to what I have already published. The following is a summary of my views regarding cod-liver oil, as a remedy for phthisis:—

1. Cod-liver oil is, as M. Taufflied pointed out, an *analeptic* (αναλαμβανω, to repair), and is indicated in all cases of anormal nutrition dependent on want of assimilation of fatty matter.

2. It is readily digestible under circumstances where no other kind of animal food can be taken in sufficient quantity to furnish the tissues with a proper amount of fatty material.

3. It operates by combining with the excess of albuminous constituents of the chyme, and forming in the villi and terminal lacteals those elementary molecules of which the chyle is originally composed.

4. Its effects in phthisis are to nourish the body, which increases in bulk and in vigour; to check fresh exudations of tubercular matter, and to diminish the cough, expectoration, and perspiration.

5. The common dose for an adult is a table-spoonful three times a-day, which may often be increased to four, or even six, with advantage. When the stomach is irritable, however, the dose to commence with should be a tea or dessert-spoonful.

6. The kind of oil is of little importance therapeutically. The pure kinds are most agreeable to the palate; but the brown coarser kinds have long been used with advantage, and may still be employed with confidence whenever cheapness is an object.

7. I have never observed its employment to induce pneumonia, or fatty disease of the liver or kidney, however long continued, although such complications of phthisis are also exceedingly frequent.

Whilst I consider such to be the general pathology and treatment required for phthisis, which should never be lost sight of, you will be greatly mistaken if you suppose that the indications stated can always be carried out. In practice, the great difficulties to be overcome, are the numerous complications of phthisis, but, above all, that excessive derangement of the alimentary canal, which is alike the cause of the disease and the obstacle to cure. But as these complications can only be understood by a careful study of individual cases, and believing that, after the previous observations, you will follow the history of such as are in the ward with more interest, I shall now proceed to their careful analysis.

Case II.—*Phthisis Pulmonalis; Large Vomica on Left Side; Scrofulous Caries of Left Wrist-Joint; Febricula; Variola; Cystitis* (?)

History.—John Finlay, æt. 19, admitted into the clinical ward, Dec. 20, 1850. Says that he has been troubled with cough and expectoration, more or less, for the last six years, accompanied by occasional diarrhœa. For the last three weeks he has been in the surgical clinical ward, under Mr Syme, for scrofulous caries of the left wrist-joint. He has spat blood now and then, but to no great extent.

Pulmonary Signs.—On percussion, the right chest is everywhere resonant; but there is marked dulness over the whole of left chest, most complete in the subclavicular and suprascapular regions. On auscultation, loud mucous râles are heard over the whole of left chest anteriorly, with gurgling and pectoriloquy under the clavicle. Posteriorly and inferiorly on this side, there is harsh tubular breathing, with prolongation of the expiration. There is puerile respiration on right side, but otherwise nothing abnormal.

Concomitant Symptoms.—His external appearance is pale, presenting all the so-called characters of the scrofulous diathesis. There is great emaciation, and development seems to have been arrested, as he does not look above 12 years of age. The left wrist-joint is immoveable, considerably swollen, with several carious openings discharging pus. Frequent cough, with copious muco-purulent expectoration. Pulse 80; feeble. Tongue clean. Considerable nausea, and total loss of appetite. His diarrhœa has recently been checked by lead and opium pills.

Progress of the Case.—For the next three months the loss of appetite, sickness, and vomiting occurred at intervals, and the physical signs remained the same. From this period, however, his general health underwent gradual improvement, the cough was not so severe, and the expectoration became more mucous. The sweating greatly diminished, and he took food more readily. Towards the end of May, he had evidently gained much in flesh, and the discharge from the scrofulous sores in the wrist was trifling. The physical signs were so far altered that the mucous râles over greater part of left side were not so coarse or diffused, and the gurgling under the clavicle was now of a splashing character, and more limited. Pectoriloquy in this situation was complete, and there was absence of expansion during respiration. There could now also be heard harsh inspiration with prolonged expiration under the right clavicle; the resonance on percussion also was here slightly impaired. During June, he was much troubled with nausea and vomiting. On the 21st he was attacked with rigors, followed by all the symptoms of continued fever, which terminated by diaphoresis on the seventh day. Shortly after, he was attacked with variola, which ran its usual course. During July and August, there was gradual but marked improvement of his general health. At the end of the last-named month, the left wrist-joint was firmly anchylosed, but all the carious openings had closed up. He has had occasional diarrhœa. There was still dulness on left side, but the mucous râles were not heard so low down anteriorly. Fine crepitation with inward vocal resonance were now audible under the right clavicle. Up to the middle of October he continued slowly to improve, the sweatings and diarrhœa had ceased, and the cough was much less severe. He now complained of considerable pain during micturition, and on examining the urine it was found to contain numerous pus-corpuscles, and to be coagulable by heat and nitric acid. He continued to feel pain on urinating, and to pass pus by the urethra during the month of October. On the 3d of November, the report is:—"Marked dulness on percussion over the left chest anteriorly, and under the clavicle cracked-pot sound. Posteriorly it is resonant. On auscultation, loud friction is heard from below up to the level of the nipple, and above this loud mucous rattles passing into gurgling under the clavicle. Perfect pectoriloquy in this situation. On right side, puerile respiration; and posteriorly sibilant râle at the termination of the inspiration. No sweating or diarrhœa. Still occasional nausea and vomiting. General strength much improved, and now walks about the ward, sitting up a great portion of the day." The report on the 21st of December is:—"Still marked dulness over the whole of left side, except under the clavicle, where it is tympanitic, with cracked-pot sound. Resonance on right side good. Under acromial end of left clavicle feeble, and distant gurgling is heard. The respiration having more of a blowing character than formerly, with perfect pectoriloquy. The moist râles over the other parts of this side have disappeared. On right side puerile respiration is heard over the inferior half of lung; other-

wise, the breath-sounds are normal. Posteriorly dulness of the whole of left side, but there is no cracked-pot sound. On auscultation, the signs are the same as are heard anteriorly. His general strength has much improved. Still complains of occasional nausea and vomiting, but on the whole takes his food well. Urine limpid, containing small shreds, which, on examination with the microscope, are seen to be composed of numerous pus-corpuscles embedded in mucus; slightly coagulable on the addition of heat and nitric acid. Pain on micturition diminished."

Treatment.—The treatment of this case throughout was principally directed to improve the appetite, diminish the nausea, vomiting, and diarrhœa, and support the strength by means of cod-liver oil and generous diet. Externally, repeated blisters were applied. During the attack of febricula and variola, antimonials were given in small doses. Latterly numerous remedies were administered to lessen the pains during micturition, such as anodynes, uva ursi, bal. copaiba, diuretics, &c.; but an enema of starch and solution of morphia succeeded better than anything else.

Commentary.—This case presents many points of resemblance to that of Barclay (Case I.), especially in the scrofulous diathesis and scrofulous caries of the bone, and the cavity under one clavicle. The diseased lung was more extensively affected, and the derangement of the stomach more violent and persistent. Indeed, throughout the progress of his case, the chief difficulty in the treatment has been the management of the stomach and bowels. The cod-liver oil and diet have not produced the same marked effect as in the case of Barclay, but their operation, though slow, has still been decided; and I consider that the pulmonary lesion in this lad is in progress of cure, exactly in the same manner as took place in Case I. Unfortunately, there has latterly been developed a complication which may interfere with perfect recovery—namely, pain in micturition, with purulent and albuminous urine. There is no stricture,—and whether these symptoms are dependent on chronic cystitis, or scrofulous abscesses in the kidney, further observation alone can determine.

Case III.—*Phthisis Pulmonalis—Vomica on both sides—Typhus Fever—Chronic Bronchitis—Emphysema (?).*

History.—Alexander Turnley, æt. 34, a tailor, admitted into the clinical ward, May 6th, 1851. He has lived a sedentary life, and the digestive organs have been impaired in function for many years. Cough, with expectoration, and occasional diarrhœa, have been present for eighteen months. He entered the ward in December 1850, and remained four months labouring under advanced phthisis pulmonalis. During the five weeks he has been absent, all his symptoms have increased in intensity.

Pulmonary Signs.—There is complete dulness on percussion under the right clavicle, extending three inches downwards. Posteriorly, the upper third of the right lung is dull, and the resonance is much impaired over the two inferior thirds. On auscultation, mucous râles are heard over the upper third of the lung, anteriorly and posteriorly, both with inspiration and expiration, and there is loud bronchophony. Inferiorly, fine moist râles are audible with inspiration, prolonged expiration with occasional sibilant râle, and friction noises. Under the left clavicle, there is also dulness on percussion, but not so complete as on the opposite side, and confined to the apex. Fine moist râle is here audible accompanying the inspiration. The expiration is prolonged, and the vocal resonance increased. Over the other portions of this lung, respiration is puerile.

Concomitant Symptoms.—Constant harassing cough, with profuse muco-purulent expectoration in the nummular form. Pulse 108; weak. On one occasion lately, on attempting to rise, was seized with syncope and fell to the ground. Surface of the body pale and bloodless, covered with profuse perspiration at night. Tongue thickly coated, pain in the epigastrium, loss of appe-

tite, thirst, anorexia. Bowels generally constipated, but he is subject to frequent attacks of diarrhœa. Nervous and irritable; urinary system normal.

Progress of the Case.—Up to the 20th of June, although the physical signs remained the same, the appetite had improved, the thirst diminished, and the anorexia ceased. The sweating also was less in amount, although still present at night. On this day he was seized with distinct rigors, followed by severe febrile symptoms. In fact, typhus fever came on, which went through its usual course, the symptoms being very severe. Delirium was present several nights, some coma, gums and teeth covered with sordes, and the collapse and subsequent debility extreme. Towards the end of July, on the fever leaving him, the appetite was greatly improved, and his general health underwent a marked change for the better. The physical signs, however, remained the same. Moist râles were heard over the whole front of the chest; and at the lower part of right lung, a coarse friction murmur was present with the expiration. The sweating and expectoration were diminished, and the cough not so troublesome. During the months of August, September, and November, he has been very gradually improving; subject, however, to severe paroxysms of cough, and occasional diarrhœa. In November, the expectoration was greatly diminished in amount, was more viscous, and expectorated with greater difficulty. He complained of constrictive pains in the upper part of chest on both sides. The diarrhœa was less frequent and profuse, and the appetite tolerably good. Gurgling and pectoriloquy are heard under both clavicles, louder on the right side; but the other moist râles in front of the chest, and the friction anteriorly, have disappeared. The report on the 21st of December is—"Anteriorly, resonance impaired under both clavicles, but most so on the right side. Lungs otherwise resonant. Under right clavicle, sudden and quick cavernous inspiration, with prolonged expiration; no moist rattles, but coarse friction noises, and loud bronchophony. Over the rest of the lung, double friction murmurs are heard. Under left clavicle, loud gurgling, with increased vocal resonance; and over the remaining part of lung, crepitating and mucous rattles. Posteriorly, dulness in suprascapular regions on both sides. Lungs otherwise resonant. No gurgling over apex posteriorly. On the right side, the same sounds as anteriorly. Amount of expectoration still copious, and of a purulent nummulated character. Great difficulty of breathing, and cough at night, which prevent sleep. Obliged to sit in the upright position. General strength not improved."

Treatment.—This consisted in giving cod-liver oil, and doing what was possible to please his capricious appetite. Blisters were frequently applied externally. The fever was treated by cold to the head, antimonials, and salines at first, and afterwards by wine and brandy administered freely. Subsequently, he again took the cod-liver oil, which was occasionally suspended and alternated with chalybeates and tonics. The cough was relieved by a mixture containing morphia and sulphuric ether; and the diarrhœa by various astringents, acetate of lead, tannin, gallic acid, opium, &c., &c. Latterly, the difficulty of breathing was attempted to be alleviated by antispasmodics; and the smoking of stramonium, but without much success.

Commentary.—In this case, the stomach and intestines were even more disordered than in the last one. The loss of appetite was complete, with loathing of food, frequent vomiting, and violent diarrhœa. With considerable pains, however, he was at length enabled to take more nourishment, and some of these symptoms were lessened, and from that moment marked improvement was observable. Cavities, however, existed on both sides; and as the contraction of their walls progressed, chronic bronchitis and emphysema were induced, and he now labours under extreme difficulty of breathing. He is obliged to remain in the upright posture, and is attacked with suffocative cough, so violent as to produce vomiting. His weakness is now extreme; and under such circumstances, recovery cannot be expected. To mitigate his symptoms, anodynes have been given largely, with antispasmodic and expectorant mixtures,

—remedies which, although they may alleviate symptoms, can never produce any permanent good. Indeed, I have generally observed, that by increasing the nausea, and diminishing the appetite, they are generally opposed to a curative line of treatment.

Case IV.—*Phthisis Pulmonalis; Vomica on right side; Chronic Pleuro-Pneumonia.*

History.—Joseph Finnie, a groom, æt. 48, admitted into the clinical ward, July 18, 1851. States that he was in good health till about two months ago, when, after getting violently heated, he experienced rigors, and shortly afterwards cough, with pain in the chest, came on. A few days subsequently expectoration commenced, and the sputum assumed a purulent character, mixed with streaks of blood. Latterly there has been sweating at night, and the ankles have been slightly swollen. His diet has not been good, but the appetite has not failed him until within the last ten days.

Pulmonary Signs.—There is marked dulness on percussion over the whole of the right side anteriorly. Posteriorly the dulness is not so evident, being merely confined to the apex of the organ. Fine moist râles are heard on inspiration, and there is great increase of vocal resonance over the whole anterior surface of right chest. About the middle in front there is loud friction, over a space the size of a hand. Posteriorly, at the apex, there is a coarse moist rattle, approaching the character of gurgling. On the left side respiration is puerile, but otherwise healthy.

Concomitant Symptoms. — Cough, with copious purulent expectoration. Tongue slightly furred; moist. Appetite has been generally good until lately. Slight sweating at night. No emaciation, and otherwise healthy.

Progress of the Case.—The appetite continued bad until August 1st, when it began to improve. The cough has been very troublesome, and the amount of purulent sputum great. The moist rattle at the apex of right lung is occasionally replaced by cavernous respiration and blowing sounds. Considerable sweating at night. On the 20th of August, moist râles could be heard over the whole right side of chest, both anteriorly and posteriorly; friction still audible in front, and vocal resonance everywhere increased; gurgling and pectoriloquy at the apex of lung. Appetite, though improved, still indifferent. Expectoration diminished. During October, though he complained of wandering pains in the chest, and of considerable flatulence, his appetite improved, the sweating ceased, and his general strength increased. He was enabled to get up and walk about the ward. The fine moist râles gradually disappeared in right lung, but the dulness, pealing resonance, friction anteriorly, and gurgling at the apex continued, with absence of expansion on inspiration. During September and November, the physical signs have remained the same, with the exception of the gurgling at the apex not being so loud, and appearing more distant. He has also been gaining in flesh. The report on the 21st of December is, that "the expansion on right side of chest is much greater. The friction murmurs have disappeared, and harshness, with occasional fine sibilation, is heard over whole front on right side. Moist râles and gurgling disappeared over apex and posteriorly; in suprascapular region, harsh cavernous respiration, with reverberating vocal resonance approaching the amphoric character. On left side puerile respiration, with harshness of inspiration and prolonged expiration at the apex."

Treatment.—Counter-irritation; an expectorant and anodyne mixture, to relieve the cough; cod-liver oil, of which he has taken for months together ℥iij. daily; good diet, and gentle exercise, have constituted the treatment.

Commentary.—In this case there is a large tubercular cavern on the right side, with great pleuritic exudation and considerable intercurrent pneumonia, which is now disappearing. This man's appetite and digestive functions have hitherto been good, and there has been no difficulty in supporting the strength.

So long as this continues, and the disease is confined to one side, there is little danger of a fatal result,—indeed there is every hope, with judicious and careful management, of bringing it to a successful termination. On the other hand, the amphoric character of the cough indicates a very chronic cavity at the apex, probably with indurated walls communicating freely with the air-passages of the lung ; and, considering the dense pleuritic adhesions which exist, it must be very difficult, and will be a work of considerable time, to bring about cicatrization of the pulmonary tissue.

CASE V.—*Phthisis Pulmonalis; Vomica on right side; Death from Hœmoptysis.*

History.—Walter Cairns, æt. 35, stone-cutter, admitted into the clinical ward, February 10, 1851. On the 25th of last July, he was discharged from the corps of Sappers and Miners, at Gibraltar, in consequence of chest complaint. Shortly after, he was admitted into the hospital at Woolwich for a fistula in ano. He was discharged in March, and commenced work as a stone-cutter. In September, cough and expectoration came on, symptoms which have been gradually increasing until now.

Physical Signs.—On percussion, there is complete dulness under the right clavicle, extending three inches downwards. On auscultation, a loud mucous râle is heard in this situation, with bronchophony. On the left side, inspiration under clavicle harsh, and expiration prolonged.

Concomitant Symptoms.—Frequent and severe cough, with purulent expectoration ; constant pain in right side of chest ; pulse 120, small and weak ; tongue slightly furred ; appetite greatly impaired ; vomiting during severe fits of coughing ; diarrhœa ; profuse sweating at night. He is thin, but not emaciated. Fistula in ano still present.

Progress of the Case.—Towards the latter part of February, the mucous râle under right clavicle was changed into loud gurgling, and the bronchopony into loud pectoriloquy. All the other symptoms continued. During March, the diarrhœa considerably diminished, but the cough and expectoration increased so as to destroy rest at night. During April and May, the symptoms were stationary, but towards the end of the latter month it was observed that the cough was not so severe, but that the breathing was more difficult. The dulness on percussion had extended inferiorly, and moist râles could be heard over the whole right side, increasing in coarseness from below upwards. Increased vocal resonance also was more diffused, with strong fremitus. On the 5th of June, diarrhœa returned, and the sputa were streaked with blood. On the 17th, the diarrhœa had abated, but he experiences great pain and annoyance from the fistula in ano, which pours forth a profuse discharge. On the 25th, three or four ounces of pure blood were expectorated. Cracked-pot sound is distinctly elicited on percussion below the right clavicle. Fine crepitation may also be heard during inspiration, under left clavicle, with increased dulness on percussion. Choking sensation in the throat—pain in epigastrium—no diarrhœa. June 28th.—The sputa have continued to be mingled with blood, and occasionally mouthfuls of this fluid, quite pure, have been expectorated. At four o'clock this morning, he brought up 10 oz. of blood, mingled with a matter resembling coffee grounds, apparently from the stomach. Shortly after, about 16 oz. of florid blood gushed from his mouth, when he sank back in the bed and expired

Treatment.—Cod-liver oil and nutritious diet were given during the first few days, but the stomach was intolerant of it. Afterwards, the diarrhœa was combated by various astringents, such as opium, acetate of lead, tannin, and gallic acid. He also took, at intervals, quinine, sulphuric and nitric acids, and bitter infusions. In May, the suffocative cough was much relieved by an emetic of ipecacuanha and sulphate of zinc. The local pains in the chest were greatly relieved by the occasional application of a few leeches and blisters. During the two first attacks of hæmoptysis, gallic acid was given in two grain doses every hour, with

cold effusion on the chest. Latterly, the vomiting was checked by a mixture of naphtha, Tr. of cardamoms, and Inf. columbæ.

Sectio Cadaveris, June 29th 1851.—The body, though thin, was not greatly emaciated, there being three-eighths of an inch of fat between the abdominal integuments. Lips and nostrils stained with blood which had issued from the nose.

Lungs.—Right pleural cavity contained about six oz. of fluid, and its serous walls were united by strong and close adhesions over the upper lobe of the lung. The left pleuræ are adherent by a few easily torn adhesions. Both lungs present anteriorly extensive emphysema, with considerable but uniform dilatation of the air vesicles. The bronchi on both sides contained bloody frothy fluid, the blood predominating on the right side. *Right Lung.*—The upper and a considerable part of middle lobe much diminished in volume posteriorly by compression. There are several irregular cavities in the summit, the largest not exceeding the size of a walnut, with indurated walls. The lower lobe consists of emphysematous and condensed tissue, the latter containing more or less miliary and encysted tubercles, some of the latter as large as a pea. Scattered throughout the inferior lobe, were numerous extravasated patches of blood, varying in size from a pin's head to that of a coffee-bean, but not interfering with the crepitation of the lung. *Left Lung.*—Below the pleura-costalis, were numerous miliary tubercles, scattered over the whole surface, but aggregated more densely towards the apex. Here and there were some yellow tubercular masses the size of a pea, with puckerings corresponding to them on the pleural surface. On section, the summit of the organ contained small miliary tubercles. The substance of the inferior lobe contained very few, but was dense, less crepitant than usual, and contained some of the sanguineous patches observed in the opposite lung. Other organs healthy.

Commentary.—This was a case of chronic phthisis, which on dissection presented old ulceration on one side, and recent tubercular deposits on the other. It proved fatal by extensive hemorrhage, which caused sinking in a previously debilitated person. The fistula in ano may have contributed to the weakness, for the surgeons who were consulted refused to interfere, on the ground that the operation was not likely to be successful in a phthisical individual. Death from hæmoptysis is on the whole a rare termination of phthisis. Dr Walshe only met with two in 131 cases, and I believe the proportion to be even much smaller than this. He observes, that "a first hemorrhage having been severe, it is unlikely that a subsequent one will kill directly." But Cairns had three distinct attacks of hemorrhage, the last of which *was* directly fatal.

The treatment of this case was conducted by my colleagues for four months, before I saw him, on the palliative plan; and I may appeal to the facts it presents, in proof that such treatment produced no effect in any way checking the progress of the disease. In this respect it offers a marked contrast to the preceding cases, in which the treatment was directed by the pathological principles formerly detailed, and had for its object increasing the nutritive powers through the primæ viæ.

Case VI.—*Phthisis Pulmonalis; Bronchitis; Vomica on Right Side; Miliary Tubercles on Left Side; Hemoptysis; Death from Exhaustion.*

History.—William Ferguson, æt. 18, a merchant's clerk, was admitted into the clinical ward, April 18th, 1851. He has been subject to cough for several years, but not to such an extent as to prevent his travelling about the country, receiving orders. In December last, expectoration commenced. On two occasions he has observed the sputum to be tinged with blood. His appetite has always been irregular, and his general health indifferent. A few days previous to admission, he has been labouring under diarrhœa.

Pulmonary Signs.—Marked dulness on percussion under the right clavicle. On auscultation, the inspiration is rough over the apex of lung, and near the

sternum there is mucous râle. The expiration is prolonged over the whole of right chest. Loud bronchophony at the apex, amounting to pectoriloquy near the sternum. On the left side, the respiratory murmurs are normal, except under the clavicle, where the inspiration is harsh, the expiration prolonged, and the vocal resonance slightly increased.

Concomitant Symptoms.—Expectoration not copious, but the sputa yellowish-white, viscid, and distinctly nummular. Pain referred to a point below the centre of right clavicle. Appetite greatly impaired. No diarrhœa at present. Slight sweating at night. No other symptoms.

Progress of the Case.—He continued in much the same condition until the 23d of May, when he was attacked with febrile symptoms, and sharp pain in the left side. A double friction murmur was heard over the inferior third of left chest, anteriorly and laterally. The symptoms and signs of pleurisy had disappeared on the 1st of June; but the cough and expectoration had increased, and the moist râles below the right clavicle, which had been absent for some time, were again present. On the 14th of June, it was ascertained that the dulness now extended over the upper third of the right lung, and the moist râles were coarser and more diffused. July 5th.—Percussion under right clavicle elicits a cracked-pot sound. His general health has been vacillating; but his weakness, with the sweating at night, have on the whole increased. Anorexia and loss of appetite continue. August 30.—To-day, he brought up several ounces of florid blood, and small quantities continue to be expectorated with the sputa. Moist râles may now be heard with inspiration under left clavicle. August 9th.—Loud gurgling and pectoriloquy under right clavicle, and loud mucous râle, with bronchophony, under left clavicle. Sputum continues to be tinged with blood. Emaciation and weakness extreme. He continued to sink, and died August 21st.

Treatment.—The treatment was at first exactly the same as in the last case. Afterwards, cod-liver oil, generous diet, and wine were given, but nothing seemed to stimulate the appetite, and the nausea and other symptoms referable to the digestive organs, could not be overcome.

Sectio-Cadaveris, August 22, 1851.—Body greatly emaciated.

Lungs.—Left pleuræ adherent throughout, but not very firmly. Right pleuræ also adherent throughout, and more firmly. Adhesions firm and dense over the upper lobe. *Right Lung.*—A cavity, the size of a walnut, in the apex, of irregular form; the pulmonary tissue surrounding it and occupying the upper lobe condensed and indurated, with a number of small excavations filled with pus. The lower lobe partially condensed, but crepitating somewhat, contained numerous scattered miliary tubercles. *Left Lung.*—At the apex numerous puckerings and cicatrices, corresponding to chronic yellowish tubercles. Other recent tubercles, more or less softened, were also present, and were scattered, but thinly, throughout the two lower lobes. The *bronchi* throughout both lungs deeply congested, and loaded with purulent mucus; bronchial glands enlarged, some the size of a walnut.

In the *cœcum* a few small tubercular ulcers, surrounded by a congested ring of vessels, there were also some submucous tubercles not ulcerated. Other organs healthy.

Commentary.—The disease had attacked both lungs, and it was found impossible to rally the digestive organs to a proper performance of their functions. As a consequence, the disease marched on uninterruptedly to a fatal termination.

CASE VII.—*Phthisis Pulmonalis; Two Vomicœ on right side; Small Cavities on left side; Death from Exhaustion.*

History.—Margaret Moffat, æt. 40, a washerwoman, was admitted into the clinical ward, April 5th, 1851. For upwards of three years she has been subject to cough, expectoration, and dyspnœa. Three weeks ago, after expoure to wet and cold, she was attacked with severe pain in the right side, and

the other symptoms became aggravated. In this state she has continued until admission.

Pulmonary Signs.—The report says, there was "little or no alteration on percussion." Over the part complained of in the infra-mammary region there were loud friction noises, which were also diffused posteriorly over the inferior third of right lung. Over the upper portion of the lung, anteriorly, were dry blowing sounds, with harsh inspiration; but posteriorly, crepitation was heard over the apex. Over the left back, fine moist rattles were heard.

Concomitant Symptoms.—Sharp acute pain, increased on inspiration, below right mamma; cough troublesome, with copious expectoration of muco-purulent matter, here and there streaked with blood; considerable dyspnœa. Pulse frequent and soft; tongue covered with a brown fur; loss of appetite; thirst; skin moist.

Progress of the Case.—The pain in the side subsided on the following day, after the application of six leeches; but she complained, during April and May, of occasional return of the pain, and was particularly distressed, in addition to her other symptoms, by attacks of dyspnœa. On the 22d of June, marked dulness was ascertained to exist over the upper third of the right lung, both anteriorly and posteriorly, with mucous râle and increased vocal resonance, and on the left side, posteriorly, there was still crepitation. Sputum continues abundant, consisting of purulent matter of gelatinous consistence. Appetite bad. Profuse sweating at night. These signs and symptoms underwent very little variation until her death on the 30th of July.

Treatment.—Leeches to the side, expectorant and anodyne mixtures, with an æther draught at night, constituted the treatment during April. In May she was ordered ℥vj. of wine daily, decoction of senega, with ʒss. doses of Tr. lobel. inflat. Towards the end of the month, blisters were applied externally, and dilute sulphuric acid given internally, in doses of ten drops. In the middle of June, chalybeate and tonic mixtures were ordered, with cod-liver oil, without any effect in restoring the appetite or renovating the nutritive process.

Sectio Cadaveris, August 6, 1851.—Body greatly emaciated.

Lungs.—There were three or four ounces of fluid in the left pleura. Everywhere firm adhesions between the pleuræ on the right side. At the apex of the right lung, the pleuræ were thickened to the extent of an inch, by the formation of a dense, white fibrous structure. *Right Lung.*—There were two cavities at the apex, of irregular shape, and the size of hen's eggs. Numerous smaller ones existed, scattered throughout the lung. The pulmonary tissue was almost entirely non-crepitant, dark coloured, atrophied, and indurated. Inferiorly there were nodules of a pink fleshy material, which, on microscopic examination, were found to consist of fatty degeneration, and were composed of a multitude of fatty molecules and granules, with compound granular corpuscles. The bronchial glands were much enlarged, several of them indurated, and the size of a walnut. *Left Lung* was mostly crepitant, but contained some indurated tissue, surrounding small cavities at the apex, the largest the size of a hazel-nut. In the lower lobe, posteriorly, there was some œdematous and non-crepitant tissue. Bronchial glands also enlarged, but less than on the other side.

All the other organs healthy.

Commentary.—This must have been a very chronic case of phthisis, probably of much longer standing than she stated on coming into the house. The right lung was universally condensed, contracted, and nodules of the tubercular matter itself, mingled, perhaps, with pneumonic exudations, had passed into fatty degeneration, and presented a yellow pinkish colour. There were none of the more violent symptoms of deranged digestive action in this case, such as vomiting or diarrhœa; and I would again point to the fact, that the palliative treatment entirely failed to make any impression on the malady.

CASE VIII.—*Phthisis Pulmonalis; Large Vomica with Pneumo-Thorax (?) on left side; Softened Tubercle on right side; Bright's Disease.*

History.—James Hutchison, æt. 26, a stone-mason, admitted into the clinical ward, June 16th, 1851. Last September, after unusual exposure to wet and stormy weather, while prosecuting his occupation, was seized with distinct rigors, followed by severe pain in the chest, dyspnœa, and cough. The cough and pain left him in January, but the dyspnœa has continued. About the end of last March, he observed œdema of the legs, and that the urine was diminished in quantity, and was occasionally high coloured. These symptoms have continued since.

Pulmonary Signs.—There is marked dulness on percussion over the left side of chest anteriorly and posteriorly, most complete inferiorly. On auscultation, the respiratory murmurs are absent at the lower two-thirds of left lung; but over the superior third there is loud gurgling, both anteriorly and posteriorly. Vocal resonance is everywhere increased, but over the apex there is a harsh, brazen, almost metallic sound, on coughing. Posteriorly and inferiorly, there is ægophony. On the right side, there is dulness in the subclavicular and suprascapular regions, with crepitation and increased vocal resonance. The rest of the lung is resonant, with harsh and puerile respiration.

Concomitant Symptoms.—Cough prolonged and reverberating; sputum scanty, muco-purulent; pulse 72, soft; urine diminished in quantity, of deep red colour, sp. gr. 1020, highly coagulated by heat, and on the addition of nitric acid; great debility, with a feeling of weakness in lumbar region; appetite bad; thirst; acid taste in the mouth; nausea after taking food; bowels loose, but no diarrhœa; considerable emaciation; skin anæmic; inferior extremities œdematous; prepuce and scrotum much distended; general anasarca, but not to so great an extent as has previously existed.

Progress of the Case.—The pulmonary signs and symptoms remained the same, but under the action of the digitalis and squill pills, and a chalybeate mixture, with tonics and carminatives, the anasarca greatly diminished in ten days. The urine also became clear, but retained its coagulability. Vomiting, however, appeared; he could take no food, and the general weakness increased. He insisted on going out, though in a dying condition, on the 30th of June, and expired a few days afterwards.

Commentary.—The extent of the disease in this case, involving the whole of one lung, and part of the other, together with the extensive disorganization induced, pneumo-thorax, &c., was in itself of fatal augury. But when to this is superadded the most complete prostration, derangement of the digestive system, and extensive degeneration of the kidneys, with œdema of the lower extremities, it may well be supposed that the case admitted of nothing but palliatives. These were applied to the relief of the renal symptoms, and had partially succeeded when he left the house.

CASE IX.—*Phthisis Pulmonalis; Vomica on right side; Diabetes; Death.*

History.—Robert Fallow, a tailor, æt. 24, admitted into the clinical ward, July 8th, 1851. Last December, when in America, was attacked with bilious fever, which continued ten weeks. Shortly afterwards, he observed that the quantity of urine he passed was greatly increased, and that his thirst was excessive. Cough appeared six weeks ago, followed by purulent expectoration; and the skin, which had previously been remarkably dry, was now covered with copious sweat during the night.

Pulmonary Signs.—Percussion elicits no decided difference of sound on either side of the chest, but there is a much greater degree of resistance under the right clavicle than under the left. On auscultation, cavernous respiration is very distinct under the right clavicle, but the sounds are dry. The vocal resonance, also, is greatly increased in the same situation, and has somewhat of a metallic character. Under the left clavicle, inspiration is harsh, and ex-

piration prolonged. On the left side, posteriorly and inferiorly, the inspiration is everywhere harsh, with occasional cooing râles and prolongation of the expiration.

Concomitant Symptoms.—The expectoration is copious, muco-purulent, and of brownish tint, without distinct traces of blood. Cough severe. Tongue furred and dry, coated near the base. Appetite good. Thirst insatiable. Sour-sweet taste in the mouth. Pulse 108, small and weak. Has voided 70 oz. of urine during the last twelve hours. The addition of liq. potassæ, followed by heat, throws down a reddish-brown sediment. Skin soft and moist.

Progress of the Case.—On the 11th of July, gurgling was heard under the right clavicle. On the 20th, there was complete loss of appetite, and repugnance to food. The urine varied since last report, from 170 to 230 oz., voided in the 24 hours. Profuse sweating at night. Mucous râles heard over the whole anterior surface of chest on the right side. Vocal resonance still metallic under right clavicle, with cracked-pot sound on percussion. August 4th.—The amount of urine passed now varies from 100 to 150 oz., during the twenty-four hours. Weakness and emaciation have greatly increased; sweating and loss of appetite continue. Died at 7 P.M.

Treatment.—He was ordered a diet, consisting at first of eggs, boiled meat, and stale bread and milk; pills of opium and hyoscyamus at night, and cod-liver oil internally. An expectorant mixture, afterwards combined with antispasmodics, was ordered to relieve the cough.

Permission to examine the body could not be obtained.

Commentary.—Phthisis pulmonalis is a very common termination of diabetes in persons under 30—a circumstance which appears to me to support the pathological views formerly given, as to the great importance which should be attached to derangement of the nutritive functions, as a cause of the tubercular disease. An animal and oleaginous diet is indicated in both disorders; but when these are combined, the case may at all times be considered hopeless.

Case X.—*Phthisis Pulmonalis; Vomica on left side; Softened Tubercle on left side; Bronchitis.*

History.—David Cromarty, æt. 13, son of a shoemaker, admitted into the clinical ward, July 12, 1851. He is one of twins, and has always been a weak and delicate child. His diet has been very poor, skimmed milk being the only kind of animal food he has enjoyed. Of late, has become greatly emaciated; but, with the exception of a dry cough, has had no pulmonary symptoms.

Pulmonary Signs.—Marked dulness on percussion under the left clavicle, extending downwards over two-thirds of the lung. Resonance is also impaired under the right clavicle. On auscultation, mucous râle is heard on inspiration over the superior third of left lung, with prolonged expiration and marked increase of the vocal resonance. About the centre of the lung anteriorly, the mucous râle almost amounts to gurgling. Under the right clavicle there is crepitation, prolonged expiration, and bronchophony. Inferiorly, cooing and sibilant râles accompanying the expiration. Friction murmurs are also heard very generally over the anterior surface of chest. Posteriorly, the resonance on percussion is dull, and equal on both sides; and the moist and dry râles, with increased vocal resonance at the apex, is also heard.

Concomitant Symptoms.—Considerable emaciation; cachectic aspect; cicatrices, from previously ulcerated lymphatic glands, in the neck, and under the ear. Short and frequent cough, but little expectoration. Respirations hurried on exertion. Pulse 128, small and weak. Tongue dry and furred; no appetite; thirst; abdomen tympanitic. Profuse sweating at night.

Progress of the Case.—Under the use of cod-liver oil internally, and blisters applied to the chest externally, this boy's health underwent rapid improvement. The bronchitic and friction râles disappeared. The appetite improved,

and his strength increased. The other physical signs remained the same when he insisted on going out, which he did, July 25th.

Commentary.—This was a remarkably bad case, as both lungs were affected. Yet being young, and readily assimilating the cod-liver oil, and good diet ordered, his improvement in health was most rapid. Indeed he considered himself well, and insisted on going out, which is one of the circumstances offering obstruction to a curative plan of treatment.

The series of cases now given, offer, I think, strong proofs of the advantages to be derived from adopting, as early as possible, in cases of phthisis, a curative plan of treatment, based upon the pathology of the disease formerly given. True, the difficulties it presents to us are great, nor can it be expected to be successful, even in the majority of cases. But I have shown in the case of Barclay (Case I.), what may be effected by care and perseverance; and even should it ultimately fail, I feel satisfied that life may be prolonged, and even greater benefits derived from it, than ever follow the palliative treatment commonly employed.

CLINICAL SURGERY.

REPORT OF SURGICAL CASES OCCURRING IN HOSPITAL PRACTICE. BY R. J. MACKENZIE, ESQ., F.R.C.S.E., LECTURER ON SURGERY AND JUNIOR ORDINARY SURGEON TO THE ROYAL INFIRMARY, EDINBURGH.

ACCORDING to the regulations of the Edinburgh Royal Infirmary, the right of delivering clinical lectures in the hospital is possessed by the Senior Ordinary Surgeon, whilst the same privilege is not extended to the Junior Ordinary Surgeon. Whilst the cases occurring in the wards allotted to the Professor of Clinical Surgery and the Senior Ordinary Surgeon are thus rendered fully available for the purposes of teaching, those occurring in the practice of the Junior Surgeon, although open to the observation of the students of the hospital, lose much of the value, which they might possess by their being made the subjects of clinical instruction.

In consequence of this arrangement, and with the view of rendering the cases occurring in my wards in the hospital more generally useful, I have occasionally published the history of those possessing unusual interest; and it is my intention now to avail myself of the opportunity offered by the Conductors of the "Monthly Journal" of publishing, from time to time, clinical reports of the cases, which fall to my charge, and which appear to me to be instructive or possessed of interest.

In doing so, I shall not restrict myself to the narration of hospital cases alone, but add the reports of any others, which appear worthy of record, occurring in ordinary practice.

Restoration of the Upper Lip, Cheek, and Eyelid.

A short time ago I published the details of a case, in which I succeeded in remedying the deficiency produced by the loss of the upper lip by *the transposition of the lower lip to the situation of the upper.* I need not here repeat the different steps of the operation, as they are fully explained in the account of the above case (see "Monthly Journal of Medical Science," Oct. 1851, p. 348). The chief difficulty, encountered in the progress of the case, arose from the obstinate contraction of the mouth; and the error committed in the operation, which gave rise to this inconvenience, evidently arose, as I formerly mentioned, in the removal of the *prolabium*. This inconvenience, I have since found, may be avoided by preserving the *prolabium* of the lower lip in its situation, and uniting it to the flap brought up from over the base of the jaw.

The following case, which has lately been under treatment in my ward, will serve to illustrate the benefits of the operation, and the additional advantage of preserving the *prolabium* of the lower lip *in situ*:—

Letitia Jones, æt. 7, admitted into the hospital May 31st 1851. The deformity of the face, which is accurately represented by the accompanying wood-cut,

was the result (as in the case of Agnes Goodall), of mortification occurring during the early stage of convalescence from scarlet fever, from which she had suffered about five years previously. The sloughing had, as is usual in such cases, proceeded rapidly, nearly the entire cheek and lower eye-lid of the right side, the nose and the right half of the upper lip, being destroyed and detached in the course of a fortnight. Necrosis of the exposed bones followed, and the nasal bones, along with the greater part of the right superior maxillary, were detached some time afterwards.

When admitted into the hospital under my care, the child was in perfect health, and the parts in the neighbourhood of the extensive cicatrix in a perfectly sound condition. The absence of the lower eyelid had given rise to a vascular condition of the conjunctiva of the right eye, and the part of the cornea, which was exposed, was dull and slightly nebulous. In addition to the deformity of the features, the twisting and displacement of the mouth rendered her articulation very indistinct.

On the 6th of June, I attempted to restore the lost parts by bringing up a large flap, consisting of the lower lip (saving the *prolabium* in the manner I have formerly described, see "Monthly Journal," 1851, p. 350, Fig. 3), and of the integuments over the base of the jaw, so as to fill up the whole gap at once. The operation, however, failed from an unforeseen accident. From the effects of the chloroform, which had been pretty freely administered during the time of the operation, the poor child vomited with little cessation for thirty-six hours. From the long-continued drag thus made on the sutures, and the constant movement of the transplanted parts, union failed in the entire extent of the wound, and the flap, in spite of all means used to keep the edges together, retracted, and receded from the surface, to which it had been attached. The contracted flap, however, was retained, as far as possible, in the situation of the upper lip, and this object was so far obtained as to bring the parts into a condition nearly similar to that of simple harelip.

On the 19th of July, by the same mode of proceeding as that practised in the operation for harelip, the edges of the cleft were brought into apposition; perfect union was obtained, and the natural appearance of the upper lip was thus nearly quite restored.

The deformity of the face, however, although much diminished by the restoration of the upper lip and the replacement of the lower lip to its natural situation

was still very great, from the absence of the nose, eyelid, and greater part of the cheek; and, as the child herself and her parents were anxious that something more should be done to improve her appearance, a third operation was performed, so as to remedy, as far as possible, the remaining deficiency. This, however, was delayed for some time, in order to allow the parts to assume the position, which their subsequent contraction might give them.

On the 18th of October, the gap was filled by a large flap of skin brought from over the ramus of the jaw, the neck of the flap being situated over the upper part of the malar prominence, and its extremity corresponding to the angle of the jaw. This flap was attached by twisted and interrupted sutures to a cut surface extending from between the eyebrows along the mesial line in the former situation of the nose, and along the upper border of the new upper lip. The large flap thus transplanted retained its vitality in its entire extent, and primary union was obtained along the whole line of incision. The edges of the wound made in dissecting up the flap were united by one or two sutures at the lower extremity of the incisions. The remainder of the surface was left to granulate, and healed quickly.

The result of these operations is shown in the accompanying sketch, which

was made between six and seven weeks after the performance of the last operation. In addition to the improved appearance of the features, her articulation has been rendered much more distinct, an advantage which was contemplated in deciding at first as to the expediency of surgical interference.

The child, nothing daunted by what she had undergone (the different operations were performed while she was under the influence of chloroform), was now anxious to have her appearance still further improved by the formation of a nose. This proposal, I need scarcely say, was negatived; the modified Tagliacotian operation being one, which is apparently applicable only in adults. However much the addition of a nose might have added to the present appearance of the child, the propriety of deferring the operation till the face and brow had attained their full size, cannot, I think, admit of any doubt.

The amount of improvement obtained in this case, may be estimated by comparing the above sketches, which delineate faithfully the appearances presented before and after the performance of the operations. When such extensive destruction of the features has taken place as in this case, operative surgery cannot be expected by any means to restore the natural appearance of the features; an approximation to the natural form of the parts is all that can be looked for.

Thus, flaps of skin transplanted to the situation of the eyelids, form, under the

most favourable circumstances, but a poor substitute for the natural lids. In the present case, making full allowance for the subsequent contraction of the flap, a very ample substitute for the lower eyelid was afforded at the time of the operation; but, as seen in the second sketch, the subsequent contraction of the parts has reduced the new eyelid very considerably, and left the appearance of *ectropium.* From the same cause, the new upper lip has been retracted above its proper level.

This contraction of the transplanted parts (both the shrinking of the flap which takes place immediately on its being dissected from its connections, and the subsequent contraction during and for some time after cicatrization) seems, indeed, one of the chief points to be kept in view in all such operations for the restoration of lost parts, so as to ensure an ultimately satisfactory result.

In attaching a flap of skin in its new situation in such operations, care must be taken that the deep and lateral connections of its neck are so freely divided as to leave the least possible amount of twisting or constriction of the neck, the narrowness of the neck being, I believe, generally a less source of danger to the vitality of the flap than its being too much stretched or constricted.

After attaching the transplanted parts by sutures in their new situation, in many cases no advantage seems to be derived from close approximation of the edges of the cut surface, from which the flap of skin has been dissected. When this can be effected without undue stretching of the transposed parts, the cure will be expedited by attaching the edges of the wound to each other by sutures; but, when this is done at the expense of stretching the transplanted parts and causing them to drag on the sutures, which attach them in their new situation, it is productive of harm, by tending to prevent the primary union, on which the success of the operation depends.

The parts should be united in their new situation, as far as possible, by the twisted suture, and the time of the removal of the needles must be determined partly by the progress of the wound, but chiefly by the amount of stretching to which the parts are subjected. If the parts are lax, the needles may generally be removed with safety on the fourth or fifth day, the union being supported by the application of strips of adhesive plaster. But if the parts are at all stretched, the needles should be left for two or three days longer; the trifling marks which they produce being of less moment than the risk of the separation of the edges of the wound, which is incurred by the too early removal of the needles.

In the above case, and in the case of restoration of the upper lip, which I formerly noticed, the incisions required to effect the end in view have been extensive, and the operations necessarily of a severe nature. It must be remembered, however, that the operations were performed whilst the patients were under the full influence of chloroform, and, in both cases, at the urgent request of the patient. The deformity, in each case, was such as appeared to me to justify any attempt to ameliorate the distressing condition of the patient. In the first case, the result has, I think, proved as satisfactory as could have been expected. In the present case, the result has hitherto proved equally gratifying, and, with the future addition of a nose to the present features, the improvement in the appearance of the girl will, I think, fully justify the measures which have been adopted.

Cases of Urinary Calculus.

Of the cases of stone in the bladder, in which I have performed the operation of lithotomy, the two following, which have lately occurred in hospital practice, are of peculiar interest:—

CASE I.—*Five Calculi removed by Lithotomy, each containing a Field Bean for its Nucleus.*

David Smeaton, a labourer from the county of Kinross, æt. 46, admitted into the hospital, September 17, 1851, suffering from the usual symptoms of vesical

calculus, which had been more or less urgent for six months previously. On examination with a sound, the presence of one or more calculi was easily detected.

The history of the origin of his symptoms was very imperfectly obtained at the time of his admission into the hospital, but on a more strict investigation after his recovery from the operation, the following account was obtained, which, I have reason to know, may be relied on.

About the end of March of the present year, after a carousal with two fellow labourers, with whom he lodged in a barn attached to his master's farm, a quarrel arose, in which he was knocked down and overpowered by his two companions. From the injuries he received, and from his state of intoxication, he was rendered senseless, and, whilst he was in this condition, the following cruel trick was perpetrated on him by his assailants:—

He was stripped of his clothes, and a quantity of beans (the common field or horse-beans used for feeding cattle) were thrust into his mouth and into the rectum; and lastly, several were introduced into his urethra. The manner in which these found their way into the bladder is unknown, but it is probable that several were introduced, one after another, into the orifice of the urethra, and then pushed back along the canal by the pressure of the fingers on the penis and perineum.

On the following morning he was found in a state of insensibility, with his genital organs covered with blood. His companions had made off, and have ever since escaped detection.

A number of beans were vomited, and passed *per anum* on the day following the assault, and during this and the subsequent day he suffered great pain in voiding his urine, which was mixed with blood, and contained several fragments of broken beans.

He was confined to bed for some days, but at the end of a week he had nearly recovered from his injuries, and his urinary symptoms had considerably abated in severity.

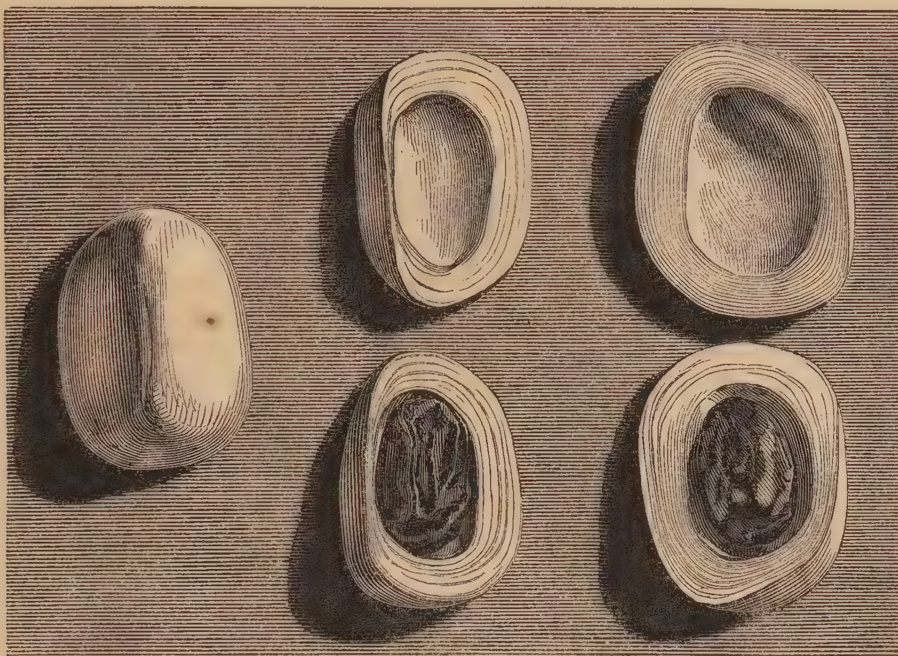
From that time forward, however, he continued to suffer more or less severely from the usual symptoms of stone in the bladder, which, as I have already said, were well marked at the time of his admission into the hospital. He was then suffering from very frequent and painful micturition. His tongue was brown and dry in the centre, and red at the point; his pulse above 90; and he had the haggard and distressed look of a patient suffering from severe urinary irritation. His urine was pale-coloured, of low specific gravity (1005), and deposited mucus and the triple phosphates in large quantity.

Under the alternate use of alkalies and dilute nitric acid with infusion of pareira, restricted diet, regulation of the state of the bowels, and the occasional use of suppositories containing muriate of morphia, his symptoms were soon much mitigated. The urine rose in density to 1015–1020, and for some days before the performance of the operation his calls to void urine were not more frequent than four or five times in the course of twenty-four hours. From the irritation consequent on the introduction of an instrument into the bladder, and from my suspicion of the existence of more than one calculus, the case seemed more favourable for the operation of lithotomy than that of lithotrity.

The lateral operation was performed on the 13th of October, and five stones were removed. No difficulty occurred in the performance of the operation. The prismatic shape and uniform size of the calculi were remarked at the time as being curious, but the presence of a foreign body as a nucleus of each was not suspected till some days afterwards, when the stones and their nuclei having been deprived of their moisture by evaporation, a hard substance was felt and heard rattling loosely in the interior of each on shaking them in the hand.

On sections of the calculi being made, the nuclei (of the introduction of which the history has since been elicited) were revealed. The incrustation was entirely composed of the triple phosphates. The sections of the calculi are well represented in the annexed woodcuts.

The patient made a speedy recovery, and left the hospital in perfect health on the 27th of November,—the wound having been quite healed for ten days previously to his dismissal.



Case II.—The following case was operated on some months ago, and is a good instance of the occasional absence of all urinary irritation attending the presence of a mulberry calculus in the bladder:—

James Love, æt. 17, a native of Edinburgh. Suffering at the time of his admission into the hospital from the usual symptoms of stone in the bladder. On examination with the sound a calculus was at once detected, which, from the roughness of its surface, and from the history of his complaints given by the patient, was believed to be of the mulberry kind.

He stated that, when a child of scarcely three years old, he had suffered from frequent and painful micturition, and that these symptoms had at that time been found to depend on the presence of a stone in the bladder, which was repeatedly felt on the introduction of an instrument. The operation for its removal, however, was, for some reason, deferred, and presently his symptoms began to abate, and after a time entirely disappeared.

From this time forwards he continued to enjoy excellent health, and never suffered the slightest uneasiness in making water, nor had he the least suspicion of the existence of any urinary affection till about three months before his admission into the hospital (fourteen years after the presence of a calculus had been detected). About that time he contracted gonorrhœa, which yielded to treatment, but was followed by the usual symptoms of vesical calculus. These symptoms he believed to depend on stricture of the urethra, for the cure of which disease he applied to be admitted into the Infirmary.

On his admission into the hospital, his condition appeared to be in every way favourable for the immediate removal of the stone. The lateral operation was accordingly performed on the following day. No difficulty presented itself in the performance of the operation. The calculus, which weighed a little more than an ounce, proved to be of the mulberry formation, but the oxalate of lime was loosely encrusted with a layer of triple phosphates, which had evidently been deposited during the previous three months, the period during which the symptoms of irritation had been present.

On the phosphatic layer being rubbed off with the finger, the calculus, as seen

in the woodcut, presented the usual dark-brown colour and appearance of the mulberry stone, the nodules on its surface being smooth and polished from the long-continued friction to which they had been subjected.

The patient made an excellent recovery, and left the hospital in good health about four weeks after the performance of the operation.

REPORT OF SOME OF THE MORE INTERESTING CASES OCCURRING IN THE CLINICAL SURGICAL WARDS OF THE ROYAL INFIRMARY. BY E. R. BICKERSTETH, ESQ., *Resident Clerk.*

Necrosis of the Articular Surface of the Head of the Humerus; Removal of the Exfoliation; Recovery.

William Morrison, an emaciated and unhealthy-looking man, æt. 21, was admitted on the 9th of October 1851, suffering from disease of the right shoulder-joint. A year before, when at work with machinery, his right arm became entangled between a strap and the wheel upon which it revolved, carrying him round with it, and severely injuring the shoulder. He immediately applied to a bone setter, who stated that the joint was out, and attempted to reduce the supposed luxation. From this he did not receive any benefit; and soon after the whole shoulder became greatly swelled and extremely painful. Leeches were applied, but without affording relief. In the course of three or four weeks, abscesses formed in the neighbourhood, and opened naturally, and these have continued to discharge ever since. During the first six months he was entirely confined to bed, and the severity of his symptoms was such, that his life was despaired of. Gradually, however, the pain abated, and the swelling decreased, leaving the joint in its present state.

On examination, the appearances are as follow:—The right shoulder is raised considerably higher than the left, and the arm is abducted, so that the elbow does not permit of being approached within four inches of the side. The shoulder-joint appears to be perfectly immoveable, but this cannot be accurately ascertained, on account of the free motions of the scapula. There is a general swelling over the entire region of the shoulder, obscuring to the view the natural prominences; and on the anterior part of the articulation is a rounded eminence, slightly raised above the general tumefaction of the parts. The acromion and coracoid processes, and spine of the scapula, can severally be traced with the finger, but more or less indistinctly, from the induration and thickening of the superjacent textures. There are four fistulous openings, from which a thin sero-purulent discharge is constantly draining. Two of these are on the external aspect of the joint, one being close to the insertion of the deltoid, and the other about two inches below the acromion. The other two are placed, one at the inferior edge

of the anterior fold of the axilla, and the other midway between this and the coracoid process. They all lead directly towards the joint, as was ascertained by the probe; and through the superior of the two, on the external side of the articulation, dead bone can be distinctly felt in the situation of the head of the humerus. The forearm and hand are thin and wasted, but otherwise present no trace of disease.

October 11*th*.—Mr Syme made an incision three inches in length on the external part of the joint, dividing in its course the fistulous opening, through which the necrosed bone had been felt with the probe. On introducing the finger, the joint was found to be totally disorganised, the head of the humerus deprived of its cartilage, and a thin shell of bone, from the convex articular surface, necrosed and detached. This was seized with the forceps, but during the extraction it fractured, and was at length brought away in four separate pieces. So far as could be felt, what remained of the head of the humerus appeared to be in a sound condition, and was covered with a firm soft substance. The state of the glenoid cavity could not be satisfactorily ascertained, on account of the head of the humerus remaining in close contact with it. Scarcely any bleeding occurred during the performance of the operation, and not a single vessel required to be secured. Afterwards, it was found that a slight degree of motion was restored to the joint. Wet lint was applied to the wound, and the patient returned to his bed. No constitutional disturbance followed. In a short time the discharge diminished, and two of the openings closed. He suffered no pain, slept well at night, his appetite returned, and his general appearance greatly improved.

On the 21*st* of *November*, the wound had completely healed, and nothing more remained than the opening at the inferior edge of the axillary fold, from which there was still a small quantity of a thin watery discharge. The general swelling of the part had almost disappeared, and the natural aspect of the joint was in great measure restored.

December 1*st*.—The last fistulous opening has now closed. Although the articulation remains firmly anchylosed, he is able to move the shoulder freely in all directions, from the increased mobility of the scapula. He can lift heavy weights, and can use the forearm and hand as well and as forcibly as before the commencement of the disease. On the 10th, he left the Infirmary and went home, intending to resume immediately his occupation, that of a labourer in a calico-printing establishment. The portions of bone extracted, when pieced together, resembled pretty accurately in size and form a large watch glass, and were found to complete almost entirely the compact structure from the convex articular head of the humerus. The small portion wanting was about the size of a fourpenny piece, and was from near the centre of the head. The external convex surface was of a reddish-brown colour, and presented the ordinary characters of an exfoliation. The concave internal part was lined with a thin, soft, highly vascular granulation membrane, which adhered closely to it, dipping into the minute cancelli attached to this surface of the compact layers. This was easily dragged away, and then nothing remained but the thin shell of bone. It was thinnest at its circumference, where the internal surface was gradually bevelled away, leaving no more than the most delicate layer of the compact structure. The same appearances were noticed at the margins of the small piece that was wanting.

Suicide by Swallowing a quantity of pure Chloroform; Post-Mortem Examination.

William White, æt. 27, upon whom Mr Syme had three years ago successfully performed amputation at the hip-joint, put an end to his existence by drinking chloroform. On Saturday afternoon, the 6th of December 1851, he went out "on pass," and returned in the evening slightly intoxicated, but still perfectly rational when spoken to, and capable of walking steadily. He went to his bed in the private ward about twelve o'clock, having wished his friends a good night, and said to some of them that he hoped he might never awake again. For some

days past he had been low and desponding, from his having received intimation that he was to leave the hospital, and being without money or friends, and fully aware of his disabled condition.

The patient who slept in the room with him stated that nothing unusual occurred until two in the morning, when, on awaking, he became aware that his companion was sound asleep on the floor, and snoring loudly. Knowing he had taken some drink, he was not alarmed, and so left matters to their natural course. At six in the morning, some of the patients from the general ward going to the private room, found him still asleep, and snoring so loudly, that they at once suspected something wrong, and their suspicions were further excited by finding the chloroform bottle lying on the bed, nearly empty, and with its neck broken off. I was immediately called, and upon going into the ward, found the man lying on his back on the floor, breathing heavily and stertorously, his face livid, and his lips almost black. He was perfectly insensible, alike to pain as to all else. The pupils were widely dilated, and did not contract on stimulus; skin warm and moist; pulse 60, full, and soft. His breath smelt strongly of chloroform, as did indeed the whole room. There was a large pool of transparent fluid on the floor around his head. Not more than an ounce and a half of chloroform remained in the bottle (an eight ounce one). The previous evening it had been full, and none had been used since.

Under the circumstances, it was impossible to say whether the chloroform had been inhaled or swallowed; but considering that he had been breathing heavily, and lying in one position for at least four hours, the evidence appeared to be in favour of the latter supposition, and in consequence, as a precautionary measure, the stomach-pump was used. By this means ten ounces of a thin turbid fluid, smelling strongly of chloroform, was brought away. Warm water was then injected, and again pumped off, and this was twice repeated, the fluid each time smelling powerfully of chloroform. He still lay perfectly insensible, without making the slightest movement or resistance. The breathing was as laboured as before, and at times ceased altogether for many seconds. Mustard was then thrown into the stomach, with the twofold view of exciting vomiting and of acting as a powerful stimulus. After being allowed to remain for ten minutes, during which time he made some slight efforts to vomit, it was again pumped off. He then appeared to be somewhat better, and the breathing became more regular and less laboured. The improvement, however, lasted but for a short time, for after half an hour's absence from the ward, I was again summoned, and found the man apparently dying. He breathed only at intervals, and then incompletely. His face and lips were puffy and deeply congested, the surface cold and clammy, and his pulse feeble and slow. As a last resource, the chest and abdomen were covered with lint soaked in turpentine, and overlaid with hot fomentation cloths, and a large turpentine enema was directed to be immediately administered. The effect was surprising: first the breathing became more regular, and then the pulse improved, becoming fuller and firmer; soon he began to move slightly, and in an hour's time was so far restored as to be thought out of immediate danger. The pupils, which had remained throughout widely dilated, became sensible, and contracted upon stimulus. Still the breathing remained heavy and stertorous.

At 11 A.M., he had regained consciousness, and was able to answer questions in monosyllables. Surface warm and moist; face suffused; eyes injected; breathing laboured and sonorous; pulse 70, soft; tongue natural.

In the afternoon, he became excessively restless, tossing about in bed, and complaining of burning pain and sense of obstruction about the throat and upper part of the chest. He suffered also from great thirst, to allay which he took large quantities of cold water, but vomited it immediately after drinking it. Each inspiratory effort was strong and laboured, but still never appeared to be completed. The obstruction was not at the larynx, but seemed rather to arise from the choked state of the trachea and bronchi. Nothing more than loud sonorous râles, which mask all other sounds, were to be heard with the stethoscope.

Upon being asked what quantity of chloroform he had taken, he said that he

had drank off from the bottle's mouth as much as he could swallow in two mouthfuls, and that after this he could remember nothing.

When seen again late in the evening, he was still in the same condition; the vomiting continued without intermission, and the dyspnœa was in no way relieved; pulse was soft, 90.

December 7th, 6 A.M.—Did not sleep at all during the night. Breathing more laboured and louder, and it is now with difficulty that he speaks between the hurried inspirations. Pulse 90, very small; is evidently sinking; stimuli were ordered, but they, as everything else he had taken, were immediately rejected.

At 10 A.M.—He attempted to sit up in bed, but fell back, and died immediately, apparently suffocated.

Examination, 30 hours after Death.—Conformation muscular; body well-developed; rigor-mortis considerable; face puffy and livid; great lividity of neck, upper part of chest, and depending parts of the trunk. On opening the chest, the lungs do not collapse; no fluid in either pleura; pericardium contains a small quantity of clear yellowish serum; right side of heart much distended with loose dark coagula; left side firmly contracted; muscular tissue healthy; valves natural; the great veins of chest and neck turgid with dark fluid blood; muscles of neck uniformly of a deep red colour.

The mucous membrane of the cavity of the mouth healthy. On opening the pharynx, the base of the tongue is found coated with a brownish fur. The mucous surface of pharynx presents a uniformly red and deeply congested appearance, extending as low down as the commencement of the œsophagus, where it ceases by an abrupt and well-defined line. The lining membrane of the larynx and trachea is also of a crimson-red colour, and is covered with numerous irregular patches of a soft, yellowish, purulent exudation, which can be easily scraped off with the knife, displaying the submucous tissue minutely injected. Ventricles of larynx filled with a dirty gray purulent fluid. The bronchi, as far as they could be traced, are loaded with the same kind of fluid; and the mucous membrane throughout presents an appearance similar to that of the trachea. The lungs are crepitant in every part. On section, the appearances observed are identical with those found in the first stage of pneumonia; œsophagus strictly healthy; stomach contained half a pint of turbid fluid; mucous membrane of cardiac end discoloured; that of pyloric end minutely injected, otherwise perfectly healthy; no trace of disease in any part of the intestinal canal. Other abdominal viscera healthy.

On removing the calvarium, the membranes of the brain are found much congested, and the sinuses turgid with dark fluid blood. Substance of brain congested, but of firm consistence. Ventricles do not contain more than half a drachm of fluid.

No odour of chloroform could be perceived during the examination of any part of the body.

Part Fourth.

PERISCOPE.

PHYSIOLOGY.

ANATOMICAL OBSERVATIONS AND PHYSIOLOGICAL EXPERIMENTS MADE ON TWO CRIMINALS AFTER DECAPITATION. BY PROFESSORS DITTRICH AND GERLACH, AND PROSECTOR HERZ, OF ERLANGEN.

OBSERVATION I.—Christine Hilpert, aged 29, mother of two children, the oldest five years, the youngest ten months, had had syphilis, and was decapitated at

twenty-one minutes to ten A.M., February 14, 1851. The first blow struck off the head, and passed through the upper portion of the third cervical vertebra. Menstruation had commenced ten days previous to her execution, and continued tolerably copious.

Thirty-four Minutes after Execution.—The pupils were tolerably dilated, and apparently insensible to the action of light. The poles of a galvanic battery being placed, one on each canthus, such a strong contraction of the orbicularis muscle was produced, as to require the forcible separation of the eyelids that the pupil might be observed;—it was found elongated horizontally. Vertical elongation took place when the poles were placed vertically. The elongation was not very distinctly marked; and on removal of the poles, the pupil became round and visibly smaller than previously. One pole being now placed on the exit foramen of the facial nerve, and the other on the corresponding side of the face, contractions of the muscles were produced, and these were rendered stronger by moving the pole from the face to the cut surface of the neck.

Thirty-eight Minutes after Execution.—Temperature of open air, 43° Fahr.; of the room, 66° Fahr.; of the mamma, 99° Fahr.; of the cavity of the chest, between the second and third ribs, on the right side, 77° Fahr.; of the peritoneal cavity in the epigastric region, 100·5° Fahr. The spleen was now rapidly removed, and its vessels being tied, placed, still reeking, on a heated porcelain plate, covered with zinc foil, but no contractions could be observed, even though one of the poles was sunk in its substance. Beautiful vermicular contractions of the ureters were, however, produced; and one of the poles having been placed on the musc. detrusor urinæ, contraction of the bladder, and escape of a considerable quantity of urine, followed. Irritation of one of the Fallopian tubes, which was hydropic, was followed by no contractions; neither could they now be produced in the ductus choledochus, stomach, or intestines. Irritation of the spinal marrow had ceased to produce general contractions.

Forty-eight Minutes after Execution.—The pole having been placed on the right auricle, rhythmical contractions ensued, and continued for a time, even after its removal; the contractions of the left auricle were less distinctly marked; the right ventricle contracted rhythmically, and these contractions were propagated to the left ventricle, which was itself incapable of being roused to contraction. No contractions could be produced in the lungs; but the intercostal muscles and diaphragm contracted strongly on one of the poles being placed on the nervus vagus, and the other on the lung. These movements were not confined to one side, but were propagated over both. Movements of the heart, stomach, and intestines did not, however, occur, nor could the latter be excited to motion, even by irritation of the cœliac plexus. Distinct contraction of the ductus thoracicus was produced; and the vena azygos contracted to a third part of its volume when the pole was laid on it. Similar phenomena followed irritation of the vena saphena magna and the arteria cruralis; but contractions could not be produced either in the abdominal aorta or ascending cava.

Sixty Minutes after Execution.—Irritation of the brachial plexus produced no movements in the superior extremity of the same side, but only contractions of the muscles in the immediate neighbourhood,—viz., those of the side of the neck; while irritation of the median nerve produced distinct contraction of the muscles to which it is distributed. When the poles were placed in contact with a portion of skin, after a time protrusion of the hair follicles—cutis anserina—occurred, and this, too, even after the skin was separated from the body. The areolæ round the nipples were also very sensitive to irritation. The small quantity of yellow fluid in the stomach was acid; the mucus in the small intestines neutral.

OBSERVATION II.—Franz Braun, aged 49, formerly a cuirassier, latterly a labourer, was executed on the 20th February 1851, at three minutes past ten. The first stroke passed between the fourth and fifth cervical vertebræ, taking with it a small portion of the latter, and was arrested by the ossified thyroid cartilage; the second stroke drove deep into the occipital bone; at the third stroke, the sword entering the first wound, separated the head.

Fifteen Minutes after Execution.—The pupils contracted on exposure to light, and dilated on being shaded, but somewhat more tardily than in a living person. Experiments similar to those made in the previous case with the galvanic apparatus, were followed by the like results, but more speedily. The grimaces of the facial muscles were most lively, and though confined to that side of the face on which the poles of the battery were placed, they extended over both. When the one pole was placed over the exit foramen of one nervus facialis, and the other on any part of the opposite cheek, on the pole being placed under the partially exposed muscles of the tongue, strong movements of protrusion were produced, though partly hindered by the closed jaw.

Eighteen Minutes after Execution.—Temperature of the open air, 41° Fahr.; of the room, 72°·5 Fahr.; of the cavity of chest, 92°·5 Fahr.; of the cavity of the abdomen, 99°·5 Fahr.

Twenty-two Minutes after Execution.—The spleen was treated precisely as in the former case, but no contractions of itself or coverings could be observed, even after the needle was sunk in its substance; nor, on cutting into it, could contraction of the trabeculæ be observed.

Twenty-eight Minutes after Execution.—The ureters contracted as formerly, but in a more lively manner, particularly that portion next the kidney. After a short interval they gradually relaxed, but this relaxation had not, after the lapse of two minutes, reached its previous extent. The vas deferens contracted in the same energetic manner. The bladder was tolerably empty, and contracted feebly, but without causing urination. The gall-ducts—hepaticus and choledochus—contracted feebly but distinctly, as likewise the stomach and intestines.

Thirty-six Minutes after Execution.—Irritation of the spinal marrow was followed by the same negative results as in the case of Hilpert. None of the cavities of the heart could be made to contract, except the right auricle, which did so rhythmically, and repeated these contractions for the space of quarter of a minute after removal of the poles. The placing of one pole on the nervus vagus, and the other on the lungs, was here also followed by contractions of the diaphragm and intercostal muscles on both sides. Contractions of the diaphragm also followed irritation of the nervus phrenicus, and these were strengthened when the phrenic was irritated deeper within the thoracic cavity. Irritation of the œsophagus produced feeble contractions of its inferior portion. The thoracic duct, vena azygos, vena saphena, vena cava ascendens, arteria cruralis, aorta abdominalis, and plexus cœliacus, when irritated, afforded the same results as in Observation I. The trabeculæ of the corpus cavernosum could not be excited to visible contraction. Irritation of the cremaster muscle produced retraction of the testicle on the same side. Irritation of the exposed nervus cruralis produced movements of the muscles on the anterior of the thigh. Irritation of the isolated nervus medianus in the middle of the arm produced lively contractions of the thumb, fore, and middle fingers. Irritation of the skin and nipples produced the same results as in the former case, but more feebly.

Sixty Minutes after Execution.—Irritation of the right vagus and the lungs is no longer followed by movements of the muscles. Temperature of the thoracic cavity, 86° Fahr.; under the diaphragm, 90°·5 Fahr. Fluids in stomach and intestines had the same re-action, as in previous case. Seminal animalcules, taken from the vas deferens, still in lively motion.

A comparison of the results of the anatomical examinations of both bodies agrees in all important particulars,—1st, In both, the vessels of the pia mater arachnoid were crammed full of air-bubbles—a fact previously observed by other investigators of sword-decapitated criminals.—Kölliker, Bischoff, Müller's Archiv., 1838, p. 499. These bubbles are not confined to the blood-vessels, but are likewise found in the loose cellular tissue of the pia mater, particularly where it dips between the convolutions. We imagine these air-bubbles to have escaped from the smaller vessels, under the influence of the great pressure to which these are so suddenly exposed, rejecting the supposition that they had made their way

between the membranes from the cut surface as untenable, on account of the intimate union which subsists between these membranes. 2d, In neither case could a trace of ciliary motion or cilia be found on the walls of the cerebral ventricles, although in one case (Braun), the observation was made only twenty-four minutes after death,—the existence of ciliary epithelium in these cavities in the adult, is thus rendered exceedingly doubtful, more especially as the observations of Kölliker agree with ours. The opinions of Purkinje and Valentin, respecting its existence, are chiefly founded on observations on the human embryo, of which we cannot speak from personal knowledge. 3d, In the four eyes examined by us, we were enabled positively to verify the evidence of the yellow spot—limbus luteus—and its central foramen. The colour was not, however, clear yellow, but a lightish shade of dark-brown, probably owing to the underlying pigment shining through the still transparent retina; this dark colour was probably the reason why Harless overlooked it, and imagined it to be a post-mortem appearance. It may be more easily demonstrated, by carefully isolating the portion of retina containing it, and laying it on a plate of glass (Kölliker). It then appears of a clear citron or straw colour. It seems to exist in the granular matter of the retina, as under the microscope the granules of the spot were seen to be intensely yellow. 4th, The condition of Hilpert's genital organs is of great physiological interest. In the left ovary a considerable effusion of blood was found in the cavity of a Graafian vesicle, which had already begun to be converted into a corpus luteum, co-existent with menstruation, which had begun ten days previously, and still continued, affording a fresh proof of the correctness of Bischoff's views respecting the periodical maturation of the ova at the menstrual period. In consequence of dropsy of the Fallopian tubes, the mouths of both were closed, and so all communication between the ovaries and uterus cut off; nevertheless, menstruation occurred regularly, and effusion of blood was found both in the cavity of the Graafian vesicle, and in that of the uterus. Although her accouchement had taken place upwards of nine months previously, the involution of the uterus was not yet complete, as appeared from the existence of spindle-shaped cells filled with oil globules, and from the friability of the uterine texture. The copious and protracted menstruation, seemed to be connected with a blennorrhœic condition of the uterine mucous membrane. The dropsy of the right Fallopian tube was fully formed—its disease the oldest; the contents and mucous membrane of the left tube were still somewhat blennorrhœic,—rendering it probable that the last impregnated ovum had passed to the uterus by this tube. She could not possibly have again become pregnant, as the mouths of both tubes were closed, probably by local peritonites, induced by the blennorrhœa of the tubes.

The difference of temperature between the two corpses—that of Hilpert being nearly 7° in the thorax, and 11° in the abdomen higher than Braun, although the examination was made ten minutes later, seemed only to be accounted for by the existence of a layer of subcutaneous fat, more than an inch thick, in the former.

The results of our experiments on the spleen coincide with those of Kölliker, and are opposed to those of Harless, who says he saw contraction of the spleen more than an hour after execution. The parenchyma of both spleens examined by us was perfectly healthy.

The puzzling contraction of the respiratory muscles, already detailed, seems only to be explicable, on the supposition that the galvanic influence was propagated from the moist surface of the lungs to the contiguous muscles.—*Präger Vierteljahrschrift*, 1851.—B.

ARTIFICIAL CELLULAR TISSUE. BY M. MELSENS.

M. Melsens recently communicated to the Academy of Brussels an experiment which ought to attract the attention of chemists and physiologists. He has remarked that the albumen of the egg, when agitated in contact with air, or any other gas, and even in vacuo, deposits flocks of a matter insoluble in water, which he calls artificial cellular tissue. This name, perhaps a little arbitrary, is attractive, if the substance insulated by M. Melsens is not simply a sort of fibrine,

separated from the white of the egg, as true fibrine is from the blood; and if it represents, as M. Melsens thinks, either a duplication [*dedoublement*] of the albumen, or an isomeric transformation, the fact will appear of great interest. It is to be remarked, that the serum of the blood does not enjoy this property of the albumen of the egg. The author also notices in this same memoir, the property which albumen possesses of being precipitated by acetic acid in the presence of chloride of sodium, but this fact has already been pointed out.—*Journ. de Pharmacie*, October 1851.

[Is this so-called artificial cellular tissue anything else than the natural fine cellular tissue of the white of egg, which is readily shown by diluting it with water, and can be separated by filtration?]

MIDWIFERY AND DISEASES PECULIAR TO WOMEN.

POLYPUS OF THE URETHRA. BY M. FORGET.

In a communication to the Surgical Society of Paris, M. Forget relates a case of excision of a polypus of the urethra, of the size of a nut. The pedicle was inserted into the mucous membrane of the urethra by a broad base. In addition, there was a *bourrelet* of prolapsed mucous membrane around the orifice of the urethra, which he removed. The disease caused great suffering when the woman received any kind of shock in walking. It was very tender to the touch, and rendered micturition painful. After the operation, a sound was introduced into the bladder, as a hæmostatic, and to facilitate compression, if that became necessary.

M. Forget mentioned a case in which the neglect of this last precaution had been followed by serious consequences. He had assisted M. Lisfranc in excising a very small polypus from the urethra. In about an hour he was called to the bedside of the patient, who had fainted from loss of blood. The bladder was distended with blood. It was found sufficient, in order to arrest the hemorrhage, to press the urethra against the pubis for a short time.—*L'Union Médicale*, 8th November 1851.

TREATMENT OF UTERINE HEMORRHAGE DURING AND AFTER DELIVERY. BY DR ALBERT DE EUERDORF.

The author recommends a concentrated solution of the muriate of iron, which he has found effectual as a styptic in cases of serious recent wounds. In cases of uterine hemorrhage, he injects into the uterus at once, 20 to 30 grammes of a tepid solution, or introduces sponge or charpie soaked in it. He has found this method successful in several cases, and has seen no inconvenience to attend it, except painful uterine contractions.—*Neue Zeitschrift für Gehburtskünde*, and *Gazette Médicale*, November 1851.

MENSTRUATION OF FEMALES IN NORWAY.

A report of the Lying-in Hospital of Christiania for 1849, by Dr F. C. Faye, the superintending physician, contains a number of interesting statistical facts. Among these we find a notice of the age, at the commencement of menstruation, of 122 of the females who had been admitted to the hospital. The flux had first appeared,—

In 2	in the	13th,	and	3	in the	14th year,
23	...	15th,	...	31	...	16th ,,
20	...	17th,	...	14	...	18th ,,
11	...	19th,	...	8	...	20th ,,
3	...	21st,	...	1	...	24th ,,

In 6 the date was not remembered. The mean age at the first menstruation appeared thus to be 17·7, which corresponds closely with the results obtained

in the preceding year. With regard to the recurrence of the periods, information was procured from 120 females. Of these, 3 menstruated every fortnight, 27 every three weeks, 83 every month, 3 every five weeks, and 4 irregularly, from the fourth till the eighth week. The duration of the discharge was noted in 87 individuals, of whom 45 reported from two to three days, 24 from three to four days, and 18 from five to eight days. The mean duration was three and a half days.

Of 128 cases of pregnancy, the papillæ in the areolæ of the breasts were observed to be enlarged in 120, but in 28 of these they were segregate and indistinct; in 8 they were wholly undeveloped.—From the *Norsk Magazin for Lægevidenskaben, udgivet af det Medicinske Selskab i Christiania*, B. iv., H. 9, 1850.

INDUCTION OF PREMATURE LABOUR. M. CAHEN.

In the "Journal de Médecine de la Société Academique de la Loire-inferieure," M. Potonnier relates a successful case of the induction of premature labour, both mother and child being saved; and in which he used the method of M. Cahen.

The patient was advanced to the seventh month of her first pregnancy, and had a deformed pelvis. To bring on labour, M. Potonnier introduced the canula of an ordinary syringe into the os uteri, and passed it for a short distance between the membranes and uterus, and then injected about three fluid-ounces of water, impregnated with a few drops of pitch resin. After seven hours and a half the woman was replaced in bed, delivery having been safely completed.—*Gazette Médicale de Paris,* October 1851.

THE LEFT ARM AND HAND OF A CHILD FOUND IN A STATE OF PUTRESCENCE, FROM STRANGULATION, THE FUNIS BEING TIGHTLY BOUND ROUND IT AT THE UPPER PART. BY MR ALBERT OWEN.

On the 3d of June last, I was sent for to a woman, the mother of four children, who was miscarrying in the seventh month of her fifth pregnancy. I found the membranes ruptured, a large discharge of the liquor amnii to have taken place, and the labour-pains occurring every fifteen or twenty minutes. There was not any flooding, nor could I, by examination, feel the child. She continued in this condition for another six hours, when the pains ceased, and she went on with her pregnancy to the full period of gestation, without any other inconvenience besides what she termed a constant "dribbling of the waters." On the 27th of July—two months after—I was again hastily summoned, and found the pains strong and regular, the os well dilated, but no portion of the child to be arrived at by manual examination. I therefore gave her a dose of the pulverised secale cornutum, which had the effect of increasing the strength of the pains; and in less than half an hour I discovered a hand outside of the vagina, and the head tightly wedged against the brim of the pelvis. All attempts to return the hand, or to pass my own, so as to turn the child, were perfectly useless; and I therefore resolved to leave the management of the case for the next half-hour to nature, when, much to my satisfaction, as if under some violent and sudden impulse, the uterus discharged the whole of its contents with such force that the fœtus and placenta both came away *en masse.* The child was dead apparently not many hours, but the entire of the left upper extremity was in a shrivelled, livid, and putrid condition; the funis tightly bound round and imbedded in the upper part of it, just below the insertion of the deltoid; in fact, the limb did not appear much more than half the size of its fellow on the other side. The mother had a good getting up, and seemed none the worse two days afterwards.—*Prov. Med. and Surg. Journal*, 15th Oct. 1851.

MATERIA MEDICA.

NOTE UPON THE USE OF SULPHATE OF BEBEERINE IN THE TREATMENT OF INTERMITTING FEVERS. BY DR A. BECQUEREL.

Under the name of Sulphate of Bebeerine, there is employed pretty commonly at the present time at Edinburgh, as a febrifuge, and in the treatment of periodical headachs and neuralgia, a new substance, which is a combination of sulphuric acid, with an alkaloid, extracted from the bark and fruit of a tree which grows in Guiana, and which is known in England under the name of Green Heart, and, in its native country, under the name of Bebeeru or Sepiri. Dr Rodie, a surgeon in the British navy, first discovered, in 1834, the febrifuge power of the bark of bebeeru, and the possibility of extracting from it an alkali, which is its active principle. Nevertheless, Dr Rodie's observations had met with little confirmation, till, in 1843, Dr Douglas Maclagan read, to the Royal Society of Edinburgh, a paper upon the bebeeru and bebeerine, in which he related numerous facts in evidence of the febrifuge action of bebeerine; and since that time, a number of English physicians,—*e. g.*, Drs Watt, Anderson, Bennett, and Simpson have proved the anti-periodic efficacy of this new substance. All have been unanimous in acknowledging, that bebeerine was a tolerably powerful febrifuge, which might be substituted with advantage for the sulphate of quinine, as much on account of its price being less (a price which might be yet much reduced), as on account of the absence of all appreciable physiological action, and, in particular, of headach, vertigo, and confusion, so common after the administering of sulphate of quinine, in somewhat large doses. Such are the facts which have caused the author to try the sulphate of bebeerine in the treatment of intermittent fevers, desirous to contribute, as far as he could, towards the solution of that important problem, the substitution of succedanea for sulphate of quinine. The author regrets, that the facts which he has collected are not sufficiently numerous; but, such as they are, he thinks them worthy of the attention of physicians, in regard to the febrifuge action of sulphate of bebeerine. The sulphate of bebeerine had no apparent action upon the stomach or nervous system, in the cases of intermittent fever which the author submitted to the use of this substance. The patients were in number seven, all males, affected with intermittent fevers, well marked and confirmed, all old, relapsing, and obstinate; four of them had fevers contracted in Africa, and complicated with miasmatic cachexia. To give to his experiments all attainable certainty, the author always waited two or three days before resorting to active treatment, in order to see, if repose and change of diet would cause the fever to cease; then he gave as an emetic, a scruple of ipecacuanha, and, as a purgative, a bottle of sedlitz water. If after these measures the fever persisted, or became regular, the patients were subjected to the use of sulphate of bebeerine; farther, to render the trials more convincing, the patients were kept fifteen days under observation in the hospital after the fever had ceased, in order to determine if they had any relapse.

Of these seven intermittent fevers, five were tertian, two quotidian. In two of the tertians, the sulphate of bebeerine completely failed. In one of these cases, there was given, every second day, in anticipation of the paroxysm, 15 grains of sulphate, repeated eight times, without obtaining any result. In the second case, the author gave, before the attack, 15 grains of sulphate of bebeerine, repeated four times; then an equal number of doses of 30 grains during the intermission. No benefit was obtained. To these two patients, the sulphate of quinine, used only in doses of 9 grains, arrested the first fit; as a precaution, however, the author again administered the same dose twice.

In the other five cases, three tertians, and two quotidians, the fever was completely stopped, by 15 grains of sulphate of bebeerine in four cases, and by 30 grains in the fifth (a tertian). Of the four fevers, in treating which he did not require to go beyond the dose of 15 grains (two tertians, two quotidians), it

was necessary to give it in one case for two days, in another case three days, and in the last two four days. The fits were always notably diminished in intensity. In the fifth case, a tertian, that in which he was obliged to augment the dose, he had given, during three days, the sulphate of bebeerine, to the extent of 15 grains, without result; the fourth day 30 grains were given, with a diminution of the paroxysm; the fifth day also, 30 grains, when the fit disappeared.

After keeping these patients in hospital during fifteen days, to assure himself of the reality of the cure, he dismissed them. Three of them have not returned; a fourth came back four months after, with a tertian fever, which was treated with the sulphate of quinine, the author not having any sulphate of bebeerine at his command. The sulphate of quinine succeeded perfectly. A fifth has been reported to have returned since into one of the wards of the hospital; but the author was not able to ascertain that this was true. The author is careful not to found unwarranted conclusions upon the above facts; they are too few to entitle him, in the present state of our knowledge, to place sulphate of bebeerine among the best substitutes for sulphate of quinine. As regards intermitting fevers, he knows very well that nothing is more difficult than to decide upon the therapeutic value of any particular system of treatment. In seeing the long catalogue of medicines of every kind, and even of substances which appear scarcely of such a nature as to have any action upon the economy, all decorated with the name of febrifuge, one must own that, in a great number of cases, it is easy enough to break the chain of circumstances and conditions upon which the phenomenon of intermittence depends. To form a sure opinion upon the real nature of a new medicine, regarded as an antiperiodic, it is necessary to have collected a very numerous assemblage of facts under every variety of circumstances. But, if we take together the above facts, with those collected by Dr Rodie at Guiana, those of Dr Watt in the same country, those of Dr Anderson in India, and those of Drs Douglas Maclagan, Simpson, and Hughes Bennett at Edinburgh, it must be admitted, that in the action of sulphate of bebeerine, there is something more than a coincidence; that there is a true curative effect, the results of which entitle it to farther and more extensive trials. As to the relapses, it may be affirmed, that no medicine, even the sulphate of quinine, can secure the patients against a recurrence, especially such patients as come into hospitals, and continually commit errors of regimen and hygiene. The author does not, therefore, attach great importance to the relapses; and he calls upon his professional brethren to ascertain for themselves the febrifuge qualities of a substance, whose action is so inoffensive, and the introduction of which into practice, if the good effects be confirmed, would realise a great economy in the treatment of intermittent fevers.—*Bulletin de Thérapeutique*, October 1851.

NOTE ON THE COMPOSITION OF THE HYDRATES OF THE SESQUIOXIDE OF IRON, AND OBSERVATIONS ON THE USE OF ONE OF THEM AS AN ANTIDOTE TO ARSENIOUS ACID. M. J. LEFORT.

A notice by M. Wittstein on the modifications which the hydrate of sesquioxide of iron undergoes when covered with water, led the author to make some researches into the composition of the hydrates of sesquioxide of iron. This subject, although treated of several times by authors, still left something to be investigated.

Whatever be the mode of precipitation employed, the alkalies furnish with the persalts of iron only two hydrates, which are represented thus:—

$$2\ Fe^2\ O^3 + 3\ HO,$$
$$\text{and}\quad Fe^2\ O^3 + 2\ HO.$$

The first is always obtained when a solution of a hot salt of the peroxide of iron is treated with an equally hot solution of potass or soda.

M. Lefort analysed it when it had been thoroughly dried over sulphuric acid, and it gave 14·82; 14·55 per cent. of water. The calculated amount is 14·44. Exposed to the action of heat, it can give off water at from 176° to 212° Fah.

The second hydrate is produced when cold solutions of potass, soda, or ammonia, are poured into a cold solution of a salt of the peroxide of iron. It possesses a lower density, and a less decided brown colour, than the preceding. At about 167° it commences to lose its water. Two analyses gave 18·23 and 18·40 per cent. of water. The calculation is 18·36.

Several chemists have assigned formulas to hydrates of sesquioxide of iron, prepared by means of alkaline carbonates, either cold or boiling.

M. L. repeated all these experiments, and always discovered in the oxide so formed, quantities of carbonic acid, varying from 2 to 6 per cent. The latter of the hydrates above described is employed, as is known, to counteract poisoning by arsenious acid.

On this subject M. Wittstein made the observation, that when it had been prepared for a certain time,—say at the end of six months,—it lost the half of its water, assumed a crystalline texture, and thus became much less soluble in acids than when it was prepared recently. It is obvious of what importance this observation would be were it perfectly correct.

In order to fix his notions on this subject, M. L. examined some hydrate of sesquioxide of iron, which he had preserved in water for three years. It gave on analysis the same quantity of water as a preparation of the same substance made only some days before. Under the microscope, it did not appear to possess the slightest crystalline form; placed in contact with diluted acids, it was dissolved as quickly as that recently obtained.

Medical observation confirmed what the analysis indicated.

On the 12th May 1848, at 9 A.M., a man, B——, a butcher, thirty-five years old, of an athletic appearance, addicted to drunkenness, swallowed, with the purpose of destroying himself, about an ounce of arsenious acid, in a glass of wine, then threw himself on his bed, where, owing to the numerous libations made during the day, he was not long of falling asleep. At noon he awoke, and in desperation, but, convinced that he was going to die, although he experienced neither sickness nor colics, he swallowed at a draught a bottle of white wine. In about two hours there came on rigors, colics, intense and continued vomitings lasting till four or five o'clock in the evening. The thirst was unquenchable, twenty pints of water at least being swallowed in this lapse of time.

A physician, who was not called in till eleven o'clock at night, gave to B—— about ten ounces of hydrate of peroxide of iron, which had been preserved in water for more than two years. This man, whom the doctor had left in the evening with anxious countenance, and skin moist and cold,—in short, in a state altogether desperate,—was up the following day, and appeared to be in a satisfactory state; the day after that (the 14th), there existed no more trace of poisoning.

These facts speak for themselves, and suffice, the author thinks, to show that the hydrate of peroxide of iron, although inferior to the hydrate of magnesia as an antidote to arsenic, is yet a valuable one, even when it has been prepared for a long time.—*Journ. de Pharmacie*, October 1851.

[We wish M. Lefort had, by analysing the vomitings, proved that this man had swallowed arsenic at all. To us, the whole case appears only to have been one of drunkenness.]

CHEMICAL EXAMINATION OF BROOM (*Cytisus scoparius*, D.C.). BY DR STENHOUSE.

The broom plants examined by Dr Stenhouse had an uncommonly bitter taste. The watery decoction, evaporated down to a tenth part, leaves a gelatinous residuum, which consists chiefly of *scoparin*. This is a yellow coloured substance, which, when purified, can be got in stellate crystals, and is easily soluble in boiling water and spirit of wine. Dr Stenhouse, from five ultimate analyses, assigns to it the constitution C_{21}, H_{11}, O_{10}.

Scoparin is, according to an extensive series of experiments by Dr S., the diure-

tic principle of broom, which has been recognised by Mead, Cullen, Pearson, Pereira, and others, as one of the most efficacious diuretics in dropsy. The dose of scoparin for an adult is five or six grains. Its diuretic action begins in twelve hours, and the urine under its use is more than doubled in quantity.

From the mother liquor of the crude scoparin, Dr S. obtained, by distillation, a colourless oily liquid, which, when purified, was found to be a new volatile organic base *spartein.* This has a peculiarly bitter taste, and possesses powerful narcotic properties. A single drop dissolved by means of acetic acid affected a rabbit so much, that it lay stupified for five or six hours. Another rabbit, which took four grains, first went into a state of violent excitement, then fell into sopor, and died in three hours. The author observes that shepherds have long been acquainted with the excitant and narcotic action of broom.

The proportion of scoparin and spartein varies very much in plants grown in different localities, which probably explains the very different accounts given by practitioners of its activity as a drug. The author suggests that it would be better to employ pure scoparin free from admixture of spartein.—*Annalen der Chem. und Pharm.*, April 1851.

MEDICAL JURISPRUDENCE.

MALAPRAXIS.

At a recent sitting of the Court of Correctional Police at Paris, Mons. Deguise, a medical practitioner, was brought to trial, accused of having, through negligence, caused the death of Mons. L'Abbé, postmaster at Alfort.

His attendance had been requested in October 1850, when he had prescribed for the patient a clyster containing laudanum; but instead of ten minims, which it appears was intended, not less than thirteen *grammes*, or about 200 minims, was actually ordered, and administered in the evening. Violent symptoms of poisoning speedily ensued; remedies were applied, which appeared to produce temporary benefit; the sopor disappeared towards morning; but the patient sank during the following night, under symptoms of suppressed pulse, profuse perspiration, and complete prostration of strength.

On the question, As to whether the death had been caused through the medical attendant? Drs Cruveilhier, Devergie, and Raillé delivered a report, concluding in the negative; chiefly on the ground, that there were in medical science no known facts of deaths caused by opium, in which the patient had regained his entire consciousness, after so decided a state of narcotism—as in the case under examination. The report came farther to the conclusion, that the deceased had sunk under a severe attack of fever, complicated with poisoning by laudanum. The prior existence of this fever,—the non-persistence of the narcotism,—the cases in which far larger doses of opium had been taken with impunity,—the neglect of a proper post-mortem examination, were all stated as difficulties in the way of considering the fatal issue as a necessary consequence of the prescription of Mons. Deguise. Notwithstanding this report, the accused was ordered for trial.

In the leading of the evidence, it was found that not only Raillé, who had been called into consultation before the death of the patient, but also Devergie, Orfila, and Bérard were unanimously of opinion, that it was unjust to entertain the notion of poisoning by laudanum; and still upon the ground, that the symptoms of stupefaction had not persisted uninterruptedly up to the period of death. Orfila divided poisons into two great classes:—those whose action is remittent, like camphor and nux vomica, and those where the action is persistent. He maintained, that there was no instance of poisoning by opium, in which the symptoms had been otherwise than persistent; expressing himself to the effect that "for him, and for every one acquainted with the subject, poisoning by opium could not be held to subsist, after there had occurred any cessation of the symptoms." It was

not denied, however, by any of the medical witnesses, that the effect of the opium might have exerted some influence in promoting the fatal result.

The Court declared Mons. Deguise guilty of homicide through neglect, and condemned him to fourteen days' imprisonment, a penalty of 500 francs, and the costs.—*Nederlandsch Weekblad voor Geneeskundigen*, Amsterdam, Feb. 16, 1851.

[The report, of which we have here given an abstract, has probably been copied by our Dutch contemporary from one of the Paris journals, but the authority is not cited. The details which it presents to us are interesting under more than one aspect. It is impossible for the profession to feel indifferent towards the fate of one of its associates, placed in the painful position of a trial and conviction for malpractice, terminating fatally; while the facts of the case, and the opinions which they were the means of eliciting from highly eminent authorities, are in themselves sufficiently remarkable to arrest attention. It was not attempted to be denied in the evidence, that the excessive quantity of laudanum had been actually ordered by the accused; and, as ignorance was not alleged, we must suppose that the fatal error had arisen through haste and carelessness in writing the prescription, and through neglect of revision. It was no sufficient defence, that larger quantities had been given with impunity, unless it could have been shown that this had occurred in the great majority of instances; and, least of all, could this plea have been consistently maintained in France, where there is a general impression that opium acts more powerfully when absorbed through the rectum, than when received into the stomach. The point mainly insisted upon by the medical witnesses appears to have been the cessation of the symptoms of narcotism; but we think it will be admitted, that it was alleged with too great absoluteness, that such a cessation never occurs in fatal cases, and this circumstance, therefore, was not sufficient to disconnect the death of the patient with the prescription of Mons. Deguise. Several instances of such non-persistence, where death nevertheless ensued, are now on record; and a medical jurist, so respectable as Taylor, has considered himself justified in adopting its possibility as a recognised truth. A very recent example, reported by Dr Evans, occurs in the second Number, for the present year, of the "Transactions of the Philadelphia College of Physicians." A man had taken forty-five grains of opium, and eight hours afterwards death appeared to be impending. As a last resource, it was agreed to try the effects of electro-galvanism, under the operation of which the heart's action was resuscitated, and the patient was roused from a condition of complete unconsciousness, so that, at the end of six hours, it was hoped that he had been placed in a state of safety. Yet, six days subsequently, he died of "effusion upon the brain:" that is, doubtless, under symptoms of coma or sopor. We suspect, however, that our ingenious neighbours in France are generally too little inclined to attach importance to anything which does not emanate from themselves; and it is amusing to find Andral proceeding even so far, on one occasion, as to speak of "l'habitude où nous sommes de ne presque jamais pouvoir vérifier sur nos malades ce que les médecins Anglais observent dans leurs hôpitaux." The witnesses did not deny that the opium might have exercised some influence in promoting that fatal issue which, on more general grounds, they had asserted could not be regarded as its necessary consequence,—an admission which concedes, in the concrete, nearly all that was denied in the abstract. Upon the whole, we cannot wonder that the Court paid more regard to the confession of the mistake by the accused, and to the death, than to the objections brought to weaken the inference which naturally ensued.—Tr.]

Part Fifth.

MEDICAL NEWS.

EDINBURGH OBSTETRICAL SOCIETY.

SESSION XI.

MEETING I.—*November* 25, 1851.—Dr GRAHAM WEIR in the Chair.

CASE OF EXTROVERSION OF THE URINARY BLADDER. BY DR NIVEN.

Mrs L. was delivered on May 18th, after an easy labour. During her pregnancy she had enjoyed good health. She had previously had one child, which was of a highly nervous temperament, and subject to fits.

The child, which was of average size, presented on a cursory view the appearance of a female, and was so announced to be. Under the insertion of the umbilical cord, which was of great breadth, there appeared a tumour, corresponding in colour with the skin, but which, on the establishment of respiration, immediately became of a vivid red tint. Its breadth transversely was about an inch and a half, and about an inch longitudinally. This proved on examination to be the posterior wall of the everted bladder, with the ureters opening laterally. Inferiorly, and also on the mucous surface, another opening could be observed, after a careful examination, from which the contents of the bowels escaped. On turning the tumour upwards, a rudimentary and imperforate penis appeared. The testicles had both descended, and were in a position as if in the female labia, the two sides of the scrotum being separated by a deep fissure. No vestige of an anus could be perceived in the usual situation.

The matters passed from the bowels were always of a green colour, and never presented the usual healthy appearance. During the whole of the child's life, the bowel continued to be gradually protruded from the intestinal opening above-described until between three and four inches had escaped. The protruded portion ultimately had a bulbous portion at its base. The child was reduced by degrees to a state of extreme emaciation, and died on 17th June, aged one month.

On dissection, it was found that the opening by which the fæces escaped was into the caput cœcum, and the protruded portion consisted at the base of this portion of the bowel; the rest consisted of the termination of the ilium. The large intestine and rectum were wanting, with the exception of a short prolongation from the caput cœcum, which extended upwards for about four inches, and ended in a cul-de-sac.

The bones at the symphysis pubis were deficient to the extent of about half an inch. The foramen ovale had not completely closed.

EXTROVERSION OF THE BLADDER THROUGH THE URETHA. BY DR G. WEIR.

Dr Weir mentioned that he had lately seen a case of a different kind of extroversion of the bladder in a female child, under two years of age. It was inverted, and protruding through the dilated urethra, forming a tumour the size of a small orange. The neighbouring parts were highly inflamed, and here and there encrusted with calcareous matter. The child was put under the influence of chloroform; and attempts were made, both by Dr Mackenzie and Dr W., to reduce the tumour, but without success. The child left Edinburgh soon after Dr W.'s seeing it, and has not returned.

CASE OF SUDDEN DEATH AFTER DELIVERY, FROM CLOT IN THE HEART.
BY DR KEITH.

Dr Keith said,—In November last year, I attended Mrs —— at her first confinement. The labour was very tedious, and as the pains were very severe, I kept her under chloroform for a longer time than I have done in any other instance—during thirteen hours she was more or less under its influence. The slowness of the labour in the first stage was owing to the rigidity of the parts, and the early escape of the liquor amnii. As soon as the os uteri was fully opened, the head of the child descended into the pelvis; but although no obstacle could be felt to its further progress through the passages, it remained for at least four hours making little or no advance, notwithstanding strong expulsive contractions. Under these circumstances, and fearing the infant might suffer from the long-continued pressure, I thought it right to have recourse to the forceps, by the aid of which the delivery was effected with great ease. I now found a second bag of membranes low down in the pelvis, and the feet of a second child presenting. The pains continued, and I brought away the second child, about twenty minutes after the birth of the first. It was a very small girl; the first was a boy of medium size.

Both placentæ were found detached, and came away at once. There was no loss of blood whatever after the delivery of the first child, but along with the two placenta an enormous quantity escaped. The uterus, however, contracted almost immediately, and the discharge subsequently was not more than usual.

The effect of the sudden loss of blood was such, that for a few minutes the pulse could not be felt at the wrist at all. The patient was still under chloroform, but for a short time she seemed in a state of syncope. This very soon passed off; the pulse returned to the wrist; she slept for a short time quietly, and on awakening she showed no unusual symptom.

From this time up to the fifth day she seemed to be making a fair enough recovery, if we consider the severity of the labour, and the quantity of blood lost. The discharge was natural; milk appeared in the breasts, though in small quantity; she took her food well; and, with the exception of an acute pain, apparently of a neuralgic character, in the lower part of the back, for a few hours on the second day, she made no complaint of pain or even of tenderness anywhere. During this whole period, however, there was an unusual degree of restlessness, and an undefined feeling of discomfort, for which, though frequently asked, she could give no definite cause. The pulse was also faster than usual, and very small. These symptoms I ascribed partly to a naturally irritable and excitable temperament, aggravated by the shock of the labour, and the loss of blood, and partly to the heart's action being deranged by an unusual degree of flatulency, from a disordered state of the stomach and bowels.

On the morning of the fifth day, the nurse told me that she had spent a good night, and her own principal request was, that she might have a partridge for dinner. On feeling the pulse, however, it was much more rapid than on the previous day, and very feeble. As I could discover no other cause for this, I supposed she had been excited by the effort of nursing the child,—an office which appeared to annoy her very much, and with which she would willingly have dispensed. I however told the nurse, who had not the slightest apprehension of any mischief, the state of the pulse, and asked her to send for me immediately if she saw any unfavourable symptoms. I left at ten o'clock, and at twelve an urgent message was sent to my house. As I was out at the moment, Dr Duncan was sent for; and at half-past twelve he found her pulseless, and evidently sinking. I saw her half an hour later; she seemed then to have very slightly revived, after taking a large quantity of champaigne and brandy. The pulse was, however, quite gone at the wrist, the heart's action extremely rapid and feeble, the breathing very laborious. She was still perfectly sensible, and could speak without difficulty, and the extremities retained their usual warmth.

Dr Duncan suggested the presence of a clot in the heart, as the cause of the symptoms,—an opinion which I at once adopted, as giving the only satisfactory explanation of the sudden sinking. Dr Simpson saw her at half-past two o'clock. She died at three o'clock.

The body was examined twenty-four hours after death, in the presence of Dr Simpson, Dr Duncan, and myself. On opening the abdomen, a large quantity of serum was found in the cavity of the peritoneum, and a very thin layer of very soft lymph covered some portions of the intestines. This was most unexpected to myself, as I had entertained no suspicion whatever of the existence of peritonitis in even the slightest degree. The uterus showed no marks of inflammation, and was in all respects such as a healthy uterus would be at the same period after delivery. As the condition of the abdominal cavity appeared thus to show a sufficient cause for death, our expectation of finding a clot in the heart became less sanguine; but, on exposing that organ, we found the right side unusually distended, and on opening it, the right auricle was found quite filled with a large mass of fibrin, quite colourless, and, especially at one part where it adhered to the wall of the auricle, of a firm and almost leathery consistency. It appeared altogether different from the clot which is often found in the heart after a lingering death. I am inclined to believe that the serous effusion into the peritoneum was in a great measure the result of the mechanical obstruction to the return of the blood to the heart. In one of the cases mentioned by Dr Meigs—who is the only author who has written on death from the formation of a clot in the heart after labour—death occured in forty-eight hours, after severe loss of blood. During this time, he says, she suffered the most inexpressible respiratory distress. "She filled her pericardium with serum, while her pericordial cavity became the subject of a great effusion." Upon examining the heart twenty-four hours after death, the right auricle and ventricle were filled with a firm whitish-yellow mass of fibrin, out of which every particle of colouring matter had been washed away.

Dr Meigs is of opinion, that the clot is more apt to form in consequence of the patient, after having lost a large quantity of blood, incautiously raising herself, and bringing on a fit of fainting. I could not ascertain that my patient had fainted at all, except at the time I previously mentioned, immediately after the extraction of the placenta. Is it possible that the clot of blood had then begun to form in the heart, and had given rise to the unusual feeling of restlessness and malaise, and that it had continued to make very gradual increase till the morning of the fifth day, when the continued transmission of blood through the auricle became impossible?

Dr M. Duncan remarked, that the interesting point in this case was the peculiarity of the mode of death. When he first saw and examined the patient, she had none of the appearance of a patient sinking under puerperal fever in any of its forms. The symptoms were distinctly those of asphyxia, modified. There was the dinginess of skin, blackness of lips, with great respiratory distress, and at the same time apparent freedom of the act of respiration. On carefully examining, the hypogastrium, not the smallest amount of tenderness on pressure could be elicited. She was quite collected, answered questions with clearness, and complained only of the state of her breathing. These symptoms, he thought, were connected with the unusual clot found in the heart after death.

Dr Simpson considered the case as one of common puerperal peritonitis, in which the symptoms had been more masked than usual. The effusions found after death, in the abdomen and pelvis, showed the extensive nature of the peritonitis; and the effusion was, he thought, semi-purulent. Dr S. had written his "Thesis" to prove that peritonitis destroys, by depressing and arresting the heart's action,—a doctrine long taught by Professor Alison.

CASE OF COHESION OF CERVIX UTERI, OCCURRING AFTER A SEVERE LABOUR. BY DR MILL, OF KIRRIEMUIR.—[*Communicated.*]

Mrs ———, æt. 37, mother of four children, the three last delivered by embryulcia. Her last labour was on 31st December 1849, during which her sufferings were very severe. Her subsequent recovery was tedious,—a fœtid discoloured discharge continued from vagina for several weeks, with great prostration of strength. I attended her, along with Dr Webster, at this labour, and our impression was, that sloughing of cervix uteri, or upper part of vagina, was the cause of these symptoms. She had formerly suffered from disease of the liver, kidneys, and bladder; but after this labour improved considerably in health and strength; always, however, complaining more or less of pain in lumbar region, passing urine highly albuminous, mixed with ropy mucus, and occasionally with pus, and very fœtid. Calls to micturate were very frequent. About the end of February I was again requested, by Dr Webster, to visit her along with him, as she complained of periodical severe pains in the lower belly, accompanied with an incessant desire to make water, occurring for three to five hours daily. After these symptoms subsided, there was no abdominal tenderness or tumour to be felt. On sounding the bladder, no calculus was discernible, and the instrument could be easily introduced, causing a little pain only at the neck of the bladder. On examining per vaginam, the cervix was shortened; but no particular enlargement was felt by us. She had never had any bloody or leucorrhœal discharge, and had not menstruated since last delivery; and her husband had been in England ever since. At this time the urine was scanty, high-coloured, highly albuminous, and alkaline, containing much muco-pus. Believing these pains depended on the state of the kidneys and bladder, and irritant urinary secretion, we prescribed infusion of buchu, with muriatic acid, and opiate enemata, per rectum, to moderate the pains; also, occasional leeching of the vulva, and hot fomentations to relieve urinary irritation, and solicit the menses. Under this treatment she improved for two weeks, and had the tinct. mur. ferri. substituted for the acid; and generous diet, with wine, and a little porter, to assist in altering the alkaline state of urine. Towards the end of April, I was requested to meet Dr W. in consultation, as the periodic daily pains had returned, much increased in severity. They now resembled severe bearing-down labour pains, continuing generally four or five hours, and leaving the patient quite exhausted. On again attempting to examine the bladder, no instrument could be introduced; and the upper and fore part of the vagina was found occupied by a large round hard tumour, situated either within the uterus, or between that organ and the bladder. The uterine sound could not by any possible means be introduced through the cervix uteri. After repeated and careful examinations, Dr Webster and I came to the opinion, that this tumour was either intra-uterine, depending on retained menstrual secretion, from cohesion of the upper part of the cervix (the result of sphacelus, after the last labour), or from a polypus, or from an abscess, or cyst, situated between the uterus and bladder. From an obscure fluctuation, sometimes felt between a hand applied externally over the hypogastrium, and the finger introduced into the vagina, we rather inclined to the first opinion, and decided on attempting to dilate the os by sponge tents, and failing this, to perforate it. Dr Matthew Nimmo, from Dundee, being one day in this town, we asked him to meet us in consultation. He was of the same opinion as to its being an intra-uterine tumour, and agreed to our proposal of perforating the cervix. Accordingly, I guided the canula of a long-curved trocar as far up the cervix as I could; and introducing the trocar, carried both readily within the uterus. On withdrawing the trocar, a dark-brown discharge, of the consistence of tar, immediately began to flow in large quantity, assisted by violent expulsive pains, and injections of tepid water, to aid the flow by dilution; by next morning the tumour could hardly be felt, and the discharge continued for two weeks, gradually becoming pale and thin. Altogether, about three English pints may have come away. After the first night following the operation, the pains entirely ceased; but the feeble state of our patient prevented us dilating the arti-

ficial opening in the cervix, or keeping it forcibly patent by bougies; an abscess also formed in the upper and back part of the vagina, and burst, from which she suffered much irritative fever, precluding any interference with the os. We expect she will slowly recover her wasted strength. Should the opening close, we must again make and keep it patent. But the disease of the urinary organs, which so obscured the true nature of the case at first, will ultimately wear out our patient.—[This woman has since done well.]

PROCEEDINGS OF THE EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Some misapprehension has arisen in regard to the Society's proceedings on the 19th November, as reported in our December publication.

That report was published, as we believed, in perfect conformity with the wishes of the Society. With reference to the speeches of Mr Syme and Dr Simpson on the subject of homœopathy, we think it proper to remark, that they were published on the footing of communications, for which the authors, *and not the Society*, are responsible, and therefore appeared to us to require no further sanction for their publication than the vote of the Society, which permitted their exception from the rule regulating the proceedings of private business.

In our future reports of the transactions of the Medico-Chirurgical Society, we propose, if permitted by the Society, not simply to copy its minutes, but freely to avail ourselves of every means of information which the kind co-operation of the secretaries and other members of the Society may put at our disposal. We shall thus at once relieve the Society of all responsibility in our reports of its proceedings, and be enabled to present these to our readers in the shape, and at the time, which we shall deem most suitable.

DUBLIN SURGERY.

It is alleged that the following description of an "Operation" for marking Deserters suggested the obnoxious order that emanated from the Horse Guards, and entailed upon medical men the performance of this degrading duty. If such be the case, we shall have to congratulate our brethren of Dublin upon this additional contribution to practical surgery,—and also wish them joy in the prospect of a professor of military surgery so devoted to the promotion of medical science:—

Extract from a Report of ASSISTANT-SURGEON TUFFNELL, *Medical Officer of the Military Prison, Dublin.*

"I have the honour to enclose an instrument I have made for the purpose, and also to detail the mode of infliction proposed.

"The instrument consists of five triangular needles, placed side by side in a slit of wood confined by a collar of the same material, which regulates the depth to which the steel points protrude.

"The letter D having been punched (by an instrument constructed for the purpose) out of leather, spread previously with adhesive matter, the letter is moistened with the tongue, or hot water, and applied to the proper region on the side.

"The thickness of the prisoner's skin having been determined on by the medical officer in attendance, and the collar screwed down so as to regulate the protrusion of the points, the operator commences at the head of the interstice in the leather, and the needles are steadily pressed into the skin, till the whole is thoroughly punctured.

"A composition of indigo, Indian ink, or cartridge powder, mixed up with water to the consistence of cream, is then rubbed with the point of the finger forcibly into the skin.

"The leather is then removed, the part cleaned by a stroke of the operator's hand, so as to define the margin of the D, and the space corresponding to the

bars in the leather (consequently before unpricked) is now to be completed by a puncture of the instrument above and below. The whole is then to be well rubbed with the colouring matter, and a piece of sticking-plaster applied over the whole, to prevent the prisoner washing the part.

"In whatever way the puncture is made in the skin, indigo, or Indian ink (where procurable), should supersede the use of powder, as the dye of the charcoal is infinitely less penetrating than either of the pigments named."

TABLE FOR CONVERSION OF LINEAL MEASUREMENTS.

The table given in our present Number was originally drawn up by the Editor for his own use; and has since been most carefully revised and cleared of errors, by Mr James Elliot, of Edinburgh, whose valuable and kind assistance the Editor is glad to take this public opportunity of acknowledging.

If the data on which the table is founded were *mathematically* correct, the whole number of decimal places given in each column might be employed for the purposes of calculation, as in the first two examples. But as the true length of the French metre has not been so positively ascertained as to exclude the possibility of an error, even in the sixth decimal place; and as the British standard yard, according to some respectable authorities, is not fixed within $\frac{1}{36,000}$th of its length, it is obvious that the accuracy of even the sixth significant decimal figure may be reasonably questioned in all calculations into which such standard quantities enter.

The dimensions of the old Paris foot, and of the Rhineland or Prussian foot, are differently stated in many works which we have had occasion to consult. We have selected the values which, upon the whole, seem the best authenticated; but as these certainly cannot be trusted to the same extent as the metrical or the British standard, we should recommend that in calculations involving the Rhineland and old Paris line, all figures beyond the fourth significant decimal should be discarded. The results will still be found far more exact than for practical purposes is ever necessary.

The third example illustrates the mode of making calculations with the aid of the Table, when approximative accuracy only is required.

DR D. FERGUSON, DUNDEE.

Died at his residence, King Street, Dundee, on Wednesday the 26th November, David Ferguson, M.D., in the thirty-sixth year of his age. This accomplished physician had practised in Jamaica for several years with distinguished success. The disorganised state of that ill-fated island, entailing ruin on the agricultural and commercial interests, and destroying the professional prospects of nearly every practitioner in that colony, compelled Dr Ferguson to leave and settle in Scotland, where he joined his brother in copartnership. Scarcely had he commenced his career, when he was called upon to attend cases of typhus fever of the most malignant type. An enthusiast in his profession, he discharged his duty with punctuality and faithfulness, as every honourable-minded physician will do. Although warned by his medical brethren to be cautious in approaching the daily scenes of wretchedness and contagion, which are endemical in all our manufacturing towns, he fearlessly visited his fever patients, from one of whom he contracted the disease. So sensible was he of having imbibed contagion from this particular case, that he mentioned the circumstance to his friends,—was shortly afterwards seized with fever, and died on the twelfth day. Dr Ferguson's death adds another victim to a melancholy list of medical men who have lately been prematurely cut off by typhus fever in this densely-populated and ill-ventilated town.

Erratum in December No., p. 581, line 15 from foot, *for* 19th December *read* 19th November.

EXCHANGE LIST.

British and Foreign Medico-Chirurgical Review,—regular.
Chemical Gazette,—ditto.
Medical Gazette,—ditto.
Medical Times,—ditto.
Pharmaceutical Journal,—ditto.
London Journal of Medicine,—ditto.
Psychological Journal,—ditto.
The Veterinarian,—ditto.
Provincial Medical Journal,—ditto.
Dublin Quarterly Journal of Science,—ditto.
Dublin Medical Press,—ditto.
American Journal of Medical Science,—ditto.
Boston Medical and Surgical Journal,—ditto.
Buffalo Medical Journal,—not yet received.
New York Journal of Medicine,—irregular.
Philadelphia Medical Examiner,—ditto.
British American Journal of Medicine,—ought *not* to be sent by post, the charge being still quite capricious, and varying between 1d. and 3s. 4d.
Annales Médico-Psychologiques,—regular.
L'Union Médicale,—ditto.
Journal de Médecine et de Chirurgie Pratique,—ditto.
Gazette Médicale de Paris,—ditto.
Gazette des Hôpitaux,—this exchange is stopped, no Nos. having been received for many months.
Révue Médico-Chirurgicale,—irregular.
Bulletin Général de Thérapeutique,—regular.
Vierteljahrschrift für die Practische Heilkunde,—ditto.
Zeitschrift der k. k. Gesellschaft zu Wien,—regular.
Henké's Zeitschrift für die Staatsarzneikunde,—ditto.
Journal für Kinderkrankheiten von Behrend und Hildebrand,—ditto.
Caspar's Wochenschrift,—ditto.
Zeitschrift für Rationelle Medicin, von Henle and Pfeufer,—Part III. for 1850 has not been received; with the above exception, regular.
Verhandlungen der Physicalisch-Medicinischen Gesellschaft in Wursburg,—not received since September; and Nos. 1-13 of Vol. I. still wanting.
Nederlandsch Weekblad voor Geneeskundigen,—not received since September, when three Nos. reached us.
Bibliothek for Læger,—irregular.
Hygiea,—irregular, and sometimes sent by post.
Gazzetta Medica Lombarda,—irregular.
Archives Générales de Médecine,—two or three Nos. only have been received during the last twelve months.

PUBLICATIONS RECEIVED.

Physiological Researches. By Sir Benjamin C. Brodie, Bart. Collected and republished from the "Philosophical Transactions," &c. &c. London: Longmans. 1851.

Lectures on the Physical Diagnosis of the Diseases of the Lungs and Heart. By Herbert Davies, M.D., &c. London: Churchill. 1851.

Guy's Hospital Reports. Vol. VII., Part II. London. 1851.

The Principles and Practice of Obstetrical Medicine and Surgery. By Dr Francis H. Ramsbotham. London: Churchill. 1851. Third Edition.

Neuralgia: its Various Forms, Pathology, and Treatment. By C. Toogood Downing, M.D., M.R.C.S. London: Churchill. 1851. (Jacksonian Prise Essay for 1850.)

An Introductory Lecture, delivered at the London Hospital Medical School, at the commencement of Session 1851-2. By Patrick Fraser, M.D. London. 1851. (From the "London Medical Gazette.")

Inaugural Address delivered at the Opening of Sydenham College, Birmingham. By John Boon Hayes, Lecturer on Anatomy, Physiology, and Pathology. London and Birmingham. 1851.

TABLE FOR MUTUAL CONVERSION OF BRITISH AND FOREIGN LINEAL MEASUREMENTS.

* The following table, constructed on the same principles as the tables of modern works on Quantitative Chemical Analysis, will greatly facilitate the comparison of Foreign and British measurements, especially when minute, and involving decimal fractions.

To convert—	1	2	3	4	5	6	7	8	9	
1. British Inches into Millimetres,.....	25·39954	50·79908	76·19862	101·5982	126·9977	152·3972	177·7968	203·1963	228·5959	Millimetres.
2. Do. Old Paris Lines,.	11·25936	22·51872	33·77808	45·03744	56·29680	67·55616	78·81552	90·07488	101·33424	Paris Lines.
3. Do. Rhineland or Prussian Lines,	11·65275	23·30550	34·95824	46·61099	58·26374	69·91649	81·56923	93·22198	104·87473	Prussian Lines.
4. Millimetres into British Inches,.....	·03937079	·07874158	·11811237	·15748316	·19685395	·23622474	·27559553	·31496632	·35433711	British Inches.
5. Do. Old Paris Lines,...	·44329	·88658	1·32987	1·77316	2·21645	2·65974	3·10303	3·54632	3·98961	Paris Lines.
6. Do. Rhineland or Prussian Lines,	·45878	·91756	1·37633	1·83511	2·29389	2·75267	3·21145	3·67022	4·12900	Prussian Lines.
7. Old Paris Lines into British Inches,	·088815	·177630	·266445	·355260	·444075	·532890	·621705	·710520	·799335	British Inches.
8. Do. Millimetres,........	2·25586	4·51172	6·76758	9·02344	11·27930	13·53516	15·79102	18·04688	20·30274	Millimetres.
9. Do. Rhineland or Prussian Lines,	1·03494	2·06988	3·10482	4·13976	5·17469	6·20963	7·24457	8·27951	9·31445	Prussian Lines.
10. Rhineland or Prussian Lines into British Inches,	·085817	·171633	·25745	·343267	·429083	·51490	·600717	·686532	·77235	British Inches.
11. Do. Millimetres,.......	2·179704	4·359408	6·539112	8·718816	10·89852	13·07822	15·25793	17·43763	19·61734	Millimetres.
12. Do. Old Paris Lines,	·9662407	1·9324814	2·8987221	3·8649628	4·8312034	5·7974441	6·7636848	7·7299255	8·6961662	Paris Lines.

ILLUSTRATIONS OF USE OF THE ABOVE TABLE.

I.—Example.

Given 245·9003 Paris Lines. Required the value in British Inches.

By line 7 of Table,—

	Old Paris Lines.		British Inches.
	200	=	17·7630
+	40	=	3·55260
+	5	=	·444075
+	·9	=	·0799335
+	·0003	=	·0000266445
			21·8396351445 British Inches.

II.—Example.

Given ·00215 Millimetres. Required the value in British Inches.

By line 4 of Table,—

	Millimetres.		British Inches.
	·002	=	·00007874158
+	·0001	=	·000003937079
+	·00005	=	·0000019685395
			·0000846471985 British Inches.

III.—Example.

Where extreme exactitude is not required, only one or tw decimal places need be used. Thus,—

Given 21·8396 British Inches. Required the value in Paris Lines

By line 2 of Table,—

	British Inches.		Paris Lines.
	20	=	225·19
+	1	=	11·26
+	·8	=	9·01
+	·04	=	·45
			245·91 Paris Lines *very nearly*.

Data, from which the Table has been calculated, extracted from Mr Woolhouse's Table, in the *Encyc. Metropolitana*,—British foot = 1. Metre = 3·2808992. Old Paris foot = 1·06578. Rhineland or Prussian foot = 1·0298.

W. R.

Part First.

ORIGINAL COMMUNICATIONS.

Article I.—*Case of Dilatation of the Common Bile Duct.* By A. Halliday Douglas, M.D., Edinburgh, Physician to the Royal Infirmary, Lecturer on Clinical Medicine, Fellow of the Royal College of Physicians, Edinburgh.

Dilatation of the biliary passages may occur in the form of a diffused true dilatation; or it may be partial and sacculated. Both of these forms arise, to a certain extent, as the effect of mechanical obstruction; but in the following case, as is sometimes seen in other hollow viscera, a local transformation of the coats of the common duct appears to have superinduced a sacculated dilatation of unusual size; and probably, also, to have constituted the original obstruction of the tube.

Catherine Tait, aged 17, a dark-complexioned girl, a domestic servant, was admitted into the Royal Infirmary on the 28th January 1848. She had a sallow, dingy colour, amounting to imperfect jaundice. She was languid, listless, and spare, though not emaciated. She complained of unceasing pain in the right side of the abdomen, which was full, with prominence of the false ribs, and acutely tender; and dull percussion existed from the fourth right rib downwards five inches, and forwards to the epigastrium. Temperature was increased; tongue clean; bowels constipated.

History.—She stated that her complaints had originated three years previously, with pain of the right side. The symptoms had recurred again and again, with paroxysmal aggravations, which had become progressively more frequent; and during the preceding three months they had been nearly incessant, and jaundice had become more decided. The catamenia had appeared irregularly for about a year.

Progress.—The first paroxysm observed in the hospital occurred immediately after admission. It was preceded by a rigor; and the pain and tenderness of the right side of the belly became intense. The tumour increased, with febrile action; pulse was 100; tongue streaked, dry, and brown; constipation obstinate. The paroxysm lasted three days; her agony was intense during the last ten hours,

and decreased rapidly, with profuse perspiration, succeeded by extreme languor and prostration, increased jaundice, dark-coloured alvine discharges, and diminished fulness of the right side.

Subsequent to this the paroxysms recurred, with intervals more or less distinct, and little variation in the symptoms, till the month of March, when, after repeated blistering, and the use of emollient enemata, the paroxysms became less frequent, with an interval so long as fourteen days; and the bowels acted regularly, permitting the enemata to be intermitted. On the 6th of March an unusually intense paroxysm occurred, with constipation and vomiting of the ingesta. At the same time the tumour and tenderness shifted more into the lateral region. Emaciation now became decided; the paroxysms were not always so severe, nor so well marked, but they observed little intermission. Œdema of the face and feet occurred about the same date, but did not subsequently increase; and she sweated in sleep. The bowels acted freely, and the motions were usually pale, but after a paroxysm they were dark coloured.

Early in the month of June, the tumour having become perceptibly more diffused, and projecting in the lateral region, with fluctuation, tenderness, and dulness of percussion, nearly as low as the ilium, a trocar was inserted midway between the costal margin and the spine of the ilium. Thirty ounces of fluid escaped, with immediate decrease of the tumour, and relief to her distress, which for many weeks had been almost uninterrupted, and she subsequently had less of the acute suffering. No paroxysm occurred for fourteen days after the tapping. She still, however, lost ground daily, and died somewhat suddenly on the 4th July.

Treatment.—Leeching afforded no relief to the pain and tenderness of the tumour; but she experienced much benefit from hot fomentations; and at a later date repeated blistering appeared to diminish the frequency of the paroxysms. The obstinate state of the bowels, in the first instance, rendered active mercurial and other purgatives necessary; after a time emollient enemata were found to act sufficiently, and with more comfort to the patient.

Post-mortem Examination thirty hours after death.—Surface was of a dingy yellow colour; volume of flesh small; feet and ankles slightly œdematous.

On opening the abdomen, a large fluctuating sac was found occupying the whole right side of the cavity. Its external surface had the usual aspect of the peritoneal covering; and the duodenum, in the form of a flat band, was stretched across its anterior surface from above downwards; the stomach was displaced upwards, and to the left. The tumour was closely connected to the inferior surface of the liver, along with which it was removed from the body.

The sac was laid open, and was found to contain within a few ounces of half a gallon of yellow fluid, having the consistence of thin syrup, and an offensive fœtid odour. The walls of the sac were dense and fibrous, varying from a twelfth to a sixth of an inch

in thickness. The internal surface presented, in the greater part of its extent, the aspect of a reddish-green fibro-cellular texture; and, *in patches,* which were largest at the upper and lower ends of the sac, the surface had a pale, opaque, *pearly lustre,* owing to a dense fibrous layer, which was easily separable, and which was continuous with the superficial areolar layer of the contiguous greenish fibro-cellular part of the surface; and these cartilaginous-like patches had abrupt, elevated, and crescentic margins. In the upper, or hepatic, extremity of the sac were the orifices of the hepatic and cystic ducts, dilated so as to admit the finger, and separated by a crescentic fold of the lining of the sac. The hepatic duct was dilated as far as its second and third divisions; the cystic duct was unaffected in its cystic half; and the gall-bladder was undilated. After careful and difficult search in the lower end of the sac, a follicular-like orifice was found communicating with the continuation of the common bile-duct. This part of the duct was neither dilated nor thickened. The orifice, and communication between the sac and this portion of the common duct, was imperfect, and of a peculiar form;—the aperture in the sac was smaller than the caliber of the duct, and was fitted into the duct by a funnel-like process, which appeared to have more or less of a valvular property.

The liver and sac together weighed three pounds. The head of the pancreas was flattened and spread over the posterior surface of the tumour. The spleen was small. The kidneys appeared normal. The mesenteric glands were universally enlarged; some of them contained a carbonaceous deposit. The cellular tissue was everywhere infiltrated with serum.

The serous cavities of the chest contained a straw-coloured serum, the quantity of which was considerable only in the left pleura. Both pleural surfaces were coated by a dense pseudo-membranous layer of lymph, which was, for the most part, not very adherent. In the right pleura the exudation was more adherent, slightly granulated, and, on the diaphragmatic portion, there was a tubercular-like epigenesis, which was dense, white, and adherent, and, as it were, springing from the substance of the diaphragm, enveloped superficially by the dense transparent fibrous exudation. The right lung was compressed, and, in its lower lobe, carnified.

The chemical constitution of the fluid contained in the sac was determined by Dr Thomas Anderson to be as follows:—"There were distinct crystals of cholesterine in abundance, obtained by treating the evaporated fluid by ether; and the residue, treated with alcohol, yielded a substance presenting the general characters of biliary matter; a considerable quantity of biliary mucus remained undissolved by the alcohol. The dry residue of the evaporation, when burnt, gave an ash containing much soda."

This case, so far as I have been able to learn, is quite unique; and it acquires additional importance from the length of time it was

under observation. The only recorded case I know at all similar is one recorded by Dr Todd, in the first volume of the "Dublin Hospital Reports;" but his case is defective, as it proved fatal almost immediately after being seen by him. Dr Todd's case presented a *complete* obstruction; and the dilatation appears to have been *uniformly* diffused to the common and hepatic ducts, which are not reported to have undergone any *transformation* of the tissue of their coats. In these respects the case contrasts with mine; and it illustrates well the simple physical effects of the obstruction. The undilated state of the cystic duct and gall-bladder in both cases is worthy of notice, as both presented the peculiar twisted or convoluted state of the cystic duct, to which Dr Todd, with apparent reason, attributes a valvular office fitted to protect the cystic duct and bladder against the effects of obstruction. The undilated state of these portions of the biliary passages has been ascribed to the acuteness of the angle at which the cystic joins the common duct; but the state of the cystic duct in Dr Todd's case, as well as my own, casts doubt upon this idea, as in both dilatation existed of about half an inch of the choledic extremity of the cystic duct.

A question of great anatomical interest, arising out of the transformed state of the common duct in my patient, was suggested in the preliminary remark. It is perhaps not necessary to enter into the argument; but if the hepatic portion be, as it certainly is, more prone to suffer dilatation from an obstruction acting equally on the common duct, then the extreme dilatation of the *common* duct must be attributed to the *altered state* of its walls.

The precise nature of the transformation does not admit of demonstration from the facts observed and described in the report. The minute structure of the lesion was not very distinctive of anything more than mere fibrous, areolar, and epithelial formations; but analogy suggests, in connection with the state of the right pleura and mesenteric glands, that probably the lesion was tubercular.

The general diagnosis of the hepatic relation of the disease was apparent from the jaundice, constipation, and tympanitis; but the precise seat of the lesion was more difficult to determine. The intense paroxysms, with febrile action and local pain and tenderness, were difficult to explain. Similar attacks have been noticed in analogous cases; and Dr Todd's patient probably suffered from them along with the "sudden acute tenderness" which he reports. It is well to note these attacks in the absence of marked effects of inflammatory action; and the sudden abatement of the paroxysms might possibly be connected with the incompleteness of the biliary obstruction permitting the flow of the accumulated bile when distension had attained its maximum.

The remedies which appeared most to palliate her distress were the hot fomentations and purgatives. Blisters also were of some service. In a similar case, if the diagnosis could be formed with

any certainty, I would incline to the earlier puncture of the tumour, though it must be admitted, that even this remedy could afford only temporary benefit; but, considering the apparent safety with which a trocar may be introduced, I would use it early and frequently. The trocar employed was the ordinary hydrocele trocar,—a smaller one would probably not permit in any case the escape of the fluid, which must always contain more or less mucus.

ARTICLE II.—*On the Blood Origin of a certain Form of General Palsy.* By HAMILTON KINGLAKE, M.D., Physician to the Somerset and Taunton Hospital.

THE diseases of the spinal cord were almost exclusively referred by the older pathologists to certain structural changes, either in the cord itself, or in the membranes, or in the bony case in which it is inclosed; and it is only of late years, since the revival of the humoral theory, that an attempt has been made to remove many of these affections from the category of organic diseases, and to include them in the widely extending group of "blood diseases." Although general palsy is now admitted to be a not unfrequent result of the introduction of mineral and narcotic poisons into the circulation, the instances are few, and not as yet sufficiently de termined to connect the disease with that spontaneous vitiation of the blood, which arises from the elaboration of a morbid poison within the system.

With the view, therefore, of supplying what I am disposed to consider an illustration of this particular form of general palsy, the following case, that has lately been brought under my professional notice, in consultation with Dr Kelly and Mr Gillett, is recorded. I am indebted to the former gentleman for the accurate statement of the details of the case.

A clergyman, about 45 years of age, residing in Devonshire, of a tall robust frame of body, and enjoying general good health, feeling somewhat indisposed on the 14*th February* 1851, took, at bedtime, a calomel and colocynth pill. Early next morning, he imprudently stood for a quarter of an hour in his slippers and dressing-gown, superintending arrangements which were going on in a cold underground cellar. He was conscious at the time of becoming chilled. It was soon perceived that his voice was hoarse, and he complained of sore throat, and *pain and stiffness of the calves of his legs;* the latter being considered rheumatic were treated with domestic remedies until *the* 20*th* instant, on which day medical advice was first taken, and he was discovered to be affected with paralysis. From increasing difficulty in walking, his gait had now

become rambling; he felt his feet cold and numbed, also a slight tingling in his fingers: the tongue was clean, and there were no inflammatory symptoms present. The gentleman had come from a gouty family, and latterly had suffered one or two slight fits of the disease; his mode of living, a fondness for rich and piquant dishes, with the other attendant luxuries of the table, no doubt further rendered him prone to its attacks. He had, moreover, for some months past, been drinking an unusual quantity of cider, and living in a new house, which was, unavoidably during the winter, both cold and damp. He was constitutionally asthmatic, but suffered only in a slight degree, except under aggravating circumstances. It may further be remarked that, some years previously, he fell backwards in skaiting, and hurt his back, but not sufficiently to lay him up, although he felt it severely at the time.

A brisk aperient was given him; and after its operation, nux vomica in small doses. He was directed to bathe his feet in hot water every night.

By *the* 26*th*, motor-power in the lower extremities was almost entirely lost, and in the trunk and upper limbs greatly impaired; his fingers felt as though benumbed with cold; his voice was feeble; respiration at times laboured; bowels and bladder gave him a sensation of being distended, although both were evacuated. General sensation, and all the cerebral functions remained nearly, or quite, unimpaired; but his nights were very restless, and often disturbed by a dull pain in the region of the coccyx and tuberosities of the ilium, which was only relieved by his being posted up in bed. His tongue was thinly coated with a white fur; the gums free from lividity; throat sore and relaxed; he felt no thirst or feverish heat. The heart's sounds were faintly audible, without any attendant bruits; pulse small, weak, and intermitting every twentieth or thirtieth beat. He frequently felt faint. The urine was copious, sp. gr. 1012, clear, non-coagulable, and giving a strong acid re-action; a microscopic examination detected no oxalates or other crystals.

Mustard poultices were ordered to the ankles every night, and the following medicines:—

℞. Vin. Colch. ♏ x.; Liq. Potassæ ♏ xx. Aq. Distill. ℥vii.—4tis horis.
℞. Pil. Hydrarg. gr. ij. Pulv. Ipec. co. gr. iij. ft. Pil. Om. noct. sum.

March 1*st.*—Gouty symptoms appeared yesterday about his feet; and this day both great toe-joints were red, swollen, and tender. The urine was highly loaded with lithates of ammonia. His pulse had somewhat improved; but in other respects he was much the same as on previous report. It being supposed the gout showed some tendency to recede, a hot pediluvium was ordered in the evening, after which, owing to unnecessary exposure to cold, he was seized with violent shiverings, which lasted three hours, and were succeeded by profuse perspiration. The gout entirely dis-

appeared; he suffered from great faintness, cramps in the legs, and pulmonary congestion.

On the 4th, the paralysis was found to be much increased—the whole muscular system was enfeebled to the last degree, whilst all power in the inferior extremities was utterly lost; the sphincters were unaffected; but the abdominal muscles partook of the general loss of contractile power, thereby imparting the sense of fulness to the bowels (before alluded to), and rendering the process of defecation often a very tedious one. The trunk was feebly, and with difficulty supported, when the sitting posture was assumed; the diaphragm and muscles of respiration were working laboriously, and almost ineffectually, to detach by expectoration the viscid secretion of the bronchi. The hands, though totally unable to accomplish any precise movements, such as conveying food to the mouth, or buttoning clothes, were yet constantly grasping objects, with the view apparently of exciting the failing sense of muscular resistance. The power of swallowing was slightly impaired, as was also the articulation. The intellect and special senses were unaffected; the head was free from pain, or unnatural degree of heat. There had been no convulsion or spasmodic movements of the limbs; neither were any pains referred to the spine, or tenderness evinced on percussion of the vertebral column. There was a degree of restlessness in his manner, and an anxious expression of countenance; but he felt no pain. The heart's action had become more feeble, and fluttering; the pulse was soft, rapid, irregular, and intermitting every two or three beats; there was likewise an almost constant sense of faintness, which appeared to be increased by the ingestion of solid food, for which he expressed a frequent desire. The bowels were confined; the urine still high-coloured and turbid, and exhibited under the microscope numerous crystals of lithic acid.

He was desired to keep in bed (he having up to this time insisted on being dressed, and seated in a chair); and to have nutritious food in the form of jelly, beef-tea, &c., frequently given in small quantities, with such stimulants as might be requisite to obviate the existing prostration. Blisters were applied to the calves of his legs, and the following draught was prescribed:—

℞. Tr. Cantharid. ♏ xx. Inf. Cascarillæ ℥iss. Ft. Haust. ter die sum.

5th.—Urgent cough and dyspnœa, with signs of subacute bronchitis and pneumonia, called for the substitution of salines and ipecacuan for the cantharides draught.

6th.—The pulmonary symptoms increased in urgency—a fœtid mucus was with difficulty dislodged, in considerable quantities, from the air tubes, and impending suffocation obviated, by repeated doses of ether, and a large blister over the chest.

7th.—His condition remained most critical,—tongue dry and

brown,—face flushed,—general temperature raised to fever heat, and pulse powerless.

Sumat 4is horis, Tinc. Cantharid. ♏ xx. ex. aq. ℞. Hyd. Chlorid. gr. ½. Pulv. Ipec. gr. ij. cons. q. s. ft. Pil. 2dis horis sum.

9*th*.—Some general amendment evident. Mucous sub-crepitant râles confined to the left side of chest; the sputa, which were pinkish, and no longer fetid, dislodged more easily. He was only able to lie on the affected side; if turned, urgent dyspnœa and tracheal râles being the immediate consequence.

Cont. Tr. Canth. 6tis horis, et Pil. 3tis horis. Admoveatur Em. Lyttæ inter scapulas dorso.

11*th*.—The chest complaints progressing favourably,—voice stronger, and expectoration more easy,—the circulation also recovering its balance,—pulse about 115, intermitting about every twentieth beat only. The bowels, which throughout had been torpid, were now constipated. A slight yellowness of the skin, which was first noticed yesterday, had now deepened into decided jaundice,—the urine was highly loaded with lithates, and deeply stained with bile,—tongue moist and cleaning. No mercurial action on gums.

Omittantur Medicam. antea prescript. Habeat stat. Enema Tereb. et Ol. Ricin. et sumat Decoct. Aloes Co. p. r. n. ℞. Hyd. Chlor. gr. i. Ext. Colch. Acet. gr. ij. Ext. Hyos. gr. ij. ft. Pil. 4tis horis sum.

14*th*.—Gums slightly touched, and bowels freely purged. Evacuations dark, and contained bile, which they had not throughout the illness been defective in. Directed to omit the calomel pill, and take three grains of blue pill every night, to maintain slight mercurial action on the system.

28*th*.—The jaundice had entirely disappeared, and his countenance again wore its cheerful aspect. Although the bronchitis continued troublesome (requiring a persistance in expectorant and counter-irritant remedies), and great evacuation had taken place, the anticipated amendment, as respected the palsy, was beginning to show itself. After the muscles of respiration and those of the trunk—taking the inverse steps of their progressive loss of power—next in order of restoration were the hands and arms; and lastly, the legs and feet. His general health improved in equal ratio with the other amendment,—and by the aid of bitter ale and good nutriment, he soon regained his strength. The first week in April he was enabled to feed himself, and write his name again! By the end of April, to walk with assistance;—and by the middle of May, to wander unaided about his garden and grounds. The only other remedial measure, beyond regulating the stomach and bowels, which was adopted during the convalescence, was the application of the electro-galvanism to the limbs. Gentle mercurial action was maintained for several weeks, and repeated blisters were

applied to the back, with the double object of relieving the pneumonic as well as the paralytic affection.

June 24th.—In a letter, received this day, the patient states, that, excepting constipation, and some tenderness and puffiness about his feet, he thinks he is better than before his attack of illness.

Remarks.—The case above detailed appears to derive its interest from the similarity it furnishes in its origin, progress, and termination to the class of diseases that owe their existence to the circulation of a morbid poison in the blood. It may be here remarked, with reference to the possibility of the disease being occasioned by the gradual introduction into the system of a mineral or narcotic poison, that the presence of lead (which was the only poison that, under the circumstances of the case, was at all likely to be absorbed into the blood *ab extra*), failed of being detected by the ordinary chemical tests, applied both to the cider and water that were habitually consumed by the gentleman and his family. The *new* house also in which they resided was *unpainted*, so that there remained no obvious source from which the lead-poison itself could have been furnished. Thus looking, in the first place, at the earlier stages of the malady, as represented by the premonitory feeling of malaise, the consciousness of being chilled, from the temporary exposure to cold, and immediately following upon that, the soreness of the throat, the aching of the limbs, and the general prostration of muscular power, we recognise the usual antecedents of an attack of epidemic catarrh. 2dly. The tendency exhibited by the disease to run a certain definite course, in spite of the remedial measures directed to its arrest or abatement; as also the fact of a relapse or general exacerbation intervening between the onset of the disease and its full development, are features in the case which more especially characterise the class of zymotic, as well as many of the so-called constitutional affections. 3dly. The limitation of the diseased action to one particular portion of a tissue (the motor tract of the spinal cord in the case in question) is not only imitated by the artificial introduction of poisons into the blood (witness the lead palsy, in which the poison fastens itself almost entirely on the motor nerves and muscles of the hand and fore-arm; the state of anæsthesia from the inhalation of chloroform; that of fantasia or ecstacy, from the administration of Indian hemp, alcohol, and other intoxicating substances, the one implying the localisation of the poison in those portions of the nervous structure that are chiefly subservient to sensation; the other, the fixation of the poison in such parts of the same tissue as are more particularly concerned in mental acts); but it is also illustrated by the natural course of various diseases, and has in fact its analogues in the local affections peculiar to the exanthemata, the Iritis of syphilis, the affections of the fibrous tis-

sues in gout and rheumatism, and in the localised eruptions proper to many of the skin diseases. Lastly, The gradual but progressive amelioration of the palsy as the fever and jaundice, with which it was complicated, began to subside, and as critical evacuations through the kidney appeared to be obtained, are points in its history which assimilate it to the ordinary termination of those local affections that originate in, or are connected with, more or less of constitutional or febrile disorder.

Having thus cursorily viewed the case by the light of the humoral theory, it now remains to inquire how far the symptoms are capable of explanation, upon the assumed existence either of some structural change originating in the cord itself, or of some dynamic palsy-bearing influence propagated thereto from the nervous extremities, distributed over the inner or outer surface of the body.

With respect to the former supposition, it may be remarked, that the entire freedom from all pain referred to the spine, coupled with the absence of any convulsive action of the limbs, appear sufficiently to exclude the idea of the loss of motor power being connected with any active congestion of the vessels of the cord or its investments; whilst the circumstance of the motor tract of the cord being alone affected, would seem equally to forbid the notion of the palsy being the effect of such mechanical pressure as would result from hemorrhage or serous effusion into the spinal canal, seeing that the pressure of a fluid could hardly be exercised upon one division of the end (the motor) throughout its whole extent, without affecting, to a certain degree, the other also.

The hypothesis of the peripheric origin of the disease, would seem to fail, not only by reason of the absence of the causes deemed essential to its development, such as the prolonged exposure of the extremities to excessive cold, or continued irritation of the mucous surfaces; but also from the circumstance, in the case under consideration, of the very rapid extension of the morbid change to all parts of the motor column; whereas, in peripheric paraplegia going on to general palsy, the disease creeps on by slow and almost imperceptible advances, and scarcely ever perhaps reaches so far up the spine as to implicate the nerves supplying the organs within the chest and superior extremities, without being complicated with such an abnormal and pre-existing condition of the cord, as would tend, with the additional or exciting cause referred to, to give an irremediable character to the disease.

Seeing, therefore, at how many points the case recorded touches one or other of the morbid states belonging to the great class of blood diseases, and how insufficient any other hypothesis is, for the true expression of the peculiar symptoms disclosed in the progress of the malady, one can hardly avoid including it in the group to which it appears to be most closely allied.

Any elaborate attempt to assign a more exact pathology for the disease in question, by seeking to determine the specific nature of

the assumed blood poison, and the conditions which appear to have rendered certain portions only of the nervous structure obnoxious to its agency, is necessarily precluded by the prescribed limits of this paper.

It may be briefly remarked, however, with the view of indicating the direction in which the "materies morbi" of this and similar diseases may probably be found, that, with the exception of carbonic acid, *urea* is the only excrementitious matter naturally existing in the blood that is certainly known to act (when accumulated in the system to a sufficient amount) as a narcotic poison on the nervous structure.

Although the colouring matter of the bile is also held to possess a narcotic property, it appears somewhat doubtful whether this principle acting *per se*, is sufficient to fully narcotise the nervous system, seeing that the cases of jaundice associated with nervous symptoms, and terminating in coma, are generally the result of a *suppression* of the biliary secretion from mental causes, which, it is to be presumed (acting more or less generally as they do), would extend their paralysing influence to the other secreting organs of the body, including more particularly the kidney, while the blood would become further vitiated by the poison of urea—thus acquiring the necessary amount of narcotic impregnation. With respect, also, to the carbonic acid naturally existing in the blood, it may be remarked, that although its undue accumulation therein from deficient action of the respiratory organs, is calculated to act prejudicially upon the system, it would fail to exercise its strictly *narcotic* influence, until the blood became so far saturated with the gas as to induce the state of asphyxia, of which there was no indication in the case under review.

Now, applying this fact to the disease under consideration, and bearing in mind that there is direct evidence in the case as recorded, of there being formed within the system a larger quantity of bile out of one portion of the unassimilable matter contained in the blood, viz.,—the carbonaceous,—than could be excreted by the liver, may it not be presumed, looking at the gouty diathesis presented by this individual, his habit of high feeding, and the symptoms of gout that actually declared themselves in the course of the disease, that the system had, in like manner, been previously so saturated with that other division of waste matter, viz.,—the nitrogenous,—as to have elaborated therefrom a larger amount of the urine elements than could be immediately excreted by the kidneys; and that the surplus urea so retained in the blood was expended in narcotising such parts of the mucous tissue as became subjected to its agency? The specific gravity of the urine (1012) at the earlier stage of the malady, coupled with the fact of no lithic acid crystals being detected by the microscope, would render it probable, that not even the ordinary proportion of its solid constituents was eliminated by the kidneys at this period. Later in

the disease, and contemporaneous with the appearance of gout in the extremities, there was an abundant excretion of the lithates; and this, I take it, was the first attempt on the part of nature towards a restoration to the healthy state; whilst the relapse may be certainly dated from the period of intense febrile movement that subsequently occurred, and which had the effect both of removing all trace of gout in the parts previously affected, and of throwing upon the motor tract of the cord the poison that the system had before endeavoured unsuccessfully to rid itself of.

The localisation of the assumed urea poison in the motor tract of the cord, instead of in the brain, to which, in ordinary cases, it would appear to be principally attracted, might be held to exemplify that desertion, or shifting of a morbid poison from its natural habitat to a weaker and less resisting portion of the same, or even a different tissue, which is illustrated so frequently by the pericarditis supervening on rheumatism, the erysipelatous forms of peritonitis, the various internal disorders consequent on the sudden "striking in" of certain cutaneous eruptions, and more especially by the erratic course and uncertain seat of spurious or undeveloped gout. A further illustration of the occasional localisation of a poison in other than its ordinary seat, is afforded by a circumstance communicated to me by a gentleman, who had lately undergone a severe surgical operation under chloroform. His statement was this,—that having inhaled what was considered a full dose of the chloroform, he became perfectly paralysed to all motion; but yet retained a perfect consciousness of everything that was passing around him, and, moreover, felt the pain of the operation in its full intensity, thus showing that the poison had fastened on the motor rather than on the sentient division of the nervous structure. It is not impossible but that the severe fall on the back, which the subject of the foregoing case encountered some years since, may have disposed the spine to become the seat of the assumed poison rather than the brain, and thus have been the means of saving him from, perhaps, a fatal attack of what would have been termed nervous or simple apoplexy.

The question as to whether the hypothesis that has been thus provisionally framed to meet the case above detailed, is applicable or not to certain of the so-called functional diseases of the nervous system, such as the partial or complete anæsthesia of trance, catalepsy, hysteric coma, and other morbid states of a like nature, characterised by a sudden, though temporary abolition of sentient or motor power, is well worthy of considerate investigation, seeing that they present, in their limited, and often periodic existence, in their strong tendency to terminate in a complete restoration to the healthy state, and in the absence in fatal cases of all visible lesions of structure, the marks which essentially distinguished that other branch of the same family of nervous diseases, in which a perversion rather than suspension of functional power exists, such as

neuralgia, epilepsy, chorea, delirium tremens, puerperal mania, and perhaps, also, hypochondriasis, which appear in many instances obviously to result, either from the introduction of some morbific element into the blood, or from the elaboration within the system of certain noxious matters of an irritant character,—which failing, it may be presumed, of being eliminated by the excreting organs, or of being temporarily withdrawn from the circulation, through their natural attractiveness for, and incorporation with, the cutaneous or other comparatively unimportant tissue of the body, fasten themselves upon certain parts or divisions of the nervous apparatus in obedience to the affinity for the poison matter, created in such parts through the lowering and exhausting influence to which they may have been previously subjected.

It may be remarked, in conclusion, that the urine of hysterical subjects, in whom many of the diseased states above enumerated chiefly occur, is often notably deficient in solid constituents, which can only be ascribed to a temporary suspension of functional power in the kidneys, to separate from the blood the peculiar excreta destined to be eliminated through that channel. This partial and modified form of ischuria renalis is occasioned, for the most part, by sudden mental emotion, which acting, it may be presumed, upon the chemistry of the living body, after the manner of the electric force upon that of certain inorganic matters, affects, among other changes, the temporary suspension of those normal affinities or relations that subsist between the excreta retained in the blood, and the organs to which they are specially attracted, for the purpose of being removed from the system.

It is not improbable, also, that the same cause which, acting through the nervous system, thus incapacitates the excretory organs from duly performing their functions, is also instrumental in so lowering the vital energies of certain portions of the nervous substance, as to render such parts peculiarly obnoxious to one or other of the excreta so retained in the blood,—that is, either to the urea or narcotic element, or to the more irritating ingredients, not only of the urine (as represented perhaps by the lithic acid and its salts), but also of the sweat, and menstrual and intestinal secretions. In the former case, the resulting diseases would be marked by more or less of suspension of the sentient or motor power in the part of the nervous apparatus so affected, whilst in the latter event the group of nervous affections that might ensue would be characterised by an exaltation or perversion of functional power, limited to the part in which the assumed irritant poison might happen to locate itself.

ARTICLE III.—*Case of Aneurism of the upper part of the Axillary Artery, attended by certain Peculiarities, and Unsuccessfully Treated by Ligature of the Subclavian Artery.* By R. J. MACKENZIE, F.R.C.S.E., Lecturer on Surgery, and Junior Ordinary Surgeon to the Royal Infirmary, Edinburgh.

THE form of aneurism, of which I believe the following case to be an example, is that first specially described by Mr Liston in a paper read before the Royal Medical and Chirurgical Society of London in 1842.

The case which drew Mr Liston's attention to the subject of the occasional communication of arteries with the cysts of abscesses, must be in the recollection of many. It was that of a boy, who suffered from strumous abscess beneath the angle of the jaw, and where a communication existed between the cyst of the abscess and the carotid artery at its bifurcation, the coats of that vessel having apparently formed part of the walls of the abscess, and having given way at one point by ulceration, so as to give rise to the formation of a false aneurism.

The nature of the case being misunderstood, an opening was made, from which a profuse flow of arterial blood took place. The wound was immediately closed, and a ligature was placed low on the carotid artery on the following day. The case terminated fatally from secondary hemorrhage; and, on dissection, it was found that a direct communication existed between the canal of the artery and the cavity of the abscess. The opening of communication was situated on the posterior aspect of the vessel, and exactly at the bifurcation of the common carotid trunk. It was "about three lines wide, and two and a half lines long." Its edges "well-defined and slightly everted." "The external coat of the artery was distinctly traced, and afterwards dissected from the middle coat quite up to the margin of the opening, where it terminated abruptly, not being reflected on to the inner surface of the tumour."

The full details of the above case were read by Mr Liston to the Medical and Chirurgical Society of London; and a careful perusal of these details, as subsequently published by Mr Liston, can scarcely leave any doubt in the mind of the reader, that the view of the case taken by Mr Liston was correct,—viz., that the aneurism was of secondary formation,—that the disease originated in abscess,—that, the trunk of the carotid forming part of the walls of that abscess, the arterial coats gave way by ulceration at a certain point, by which the cyst, hitherto that of an abscess, was converted into that of a spurious aneurism.

Such a variety of aneurism, however, was scarcely known; sufficient attention certainly had not been directed to it. Doubts were accordingly entertained by many as to the true nature of the case,

and Mr Liston's valuable paper was refused a place in the transactions of the Society. It was, however, immediately published by the author, with an appendix, in which, along with the cases contained in the original paper, eight instances of somewhat analogous cases are collected. Of these eight cases, however, *two* only can be said to be precisely similar to that of Mr Liston. In case 8, from the work of M. Robert, of Paris, the coats of the aorta close to the origin of the innominate artery had given way by ulceration, and the blood issued from the perforation into the unopened cavity of an abscess. In case 9, by Mr Quain, of University College, London, the coats of the radial artery had been disorganised in the extension of a phlegmonous abscess. The aneurismal nature of the swelling was detected, and amputation was performed. On laying open the swelling, the destruction of the coats of the vessel was found to be so extensive, that the artery was entirely divided. The evidence as to the origin and nature of the aneurism in this case seems to be quite conclusive, and would be sufficient, in absence of other proof, to establish the fact, that the coats of an artery may, like other tissues, give way by ulceration in the extension of a yet unopened abscess.

The other six cases mentioned in the paper, I have said, are somewhat analogous to that related by Mr Liston. In none of them, however, is it distinctly proved that the ulceration of the coats of the artery preceded the opening of the abscess, whilst in some it is evident that the giving way of the artery occurred during the ulceration or sloughing of the tissues, which followed the exposure of the cavity. In one of these cases, quoted by Mr Liston, I placed a ligature on the superficial femoral artery, on account of hemorrhage from the popliteal.[1] In this case, which had been in the hospital under Mr Syme's care, an abscess had been opened in the popliteal space; and on introducing the finger into the opening, the artery was felt distinctly beating on the finger placed between the vessels and the bone. Unhealthy ulceration of the parts ensued, on account of which the patient was removed from the hospital, and three weeks intervened between the opening of the abscess and the occurrence of the hemorrhage.

The occurrence of hemorrhage from a large arterial trunk, which has become involved in the open ulceration or sloughing of surrounding tissues, is not very rare. A good many cases are recorded, where the same event has occurred at a shorter or longer interval after the opening of an abscess, which has not appeared to have been followed by well-marked ulceration of the tissues. But the opening of an artery into the cavity of an unopened abscess, so as to give rise to the formation of a false aneurism, appears either to be a lesion of very unusual occurrence, or one which, if less rare, has been too much overlooked by surgical writers. The three cases

[1] See Mr Liston's Pamphlet.

recorded by M. Robert, by Mr Liston, and by Mr Quain, are all which I have been able to find in which these precise conditions existed. A case, however, is related by Dr Edward Dewes, physician to the Coventry and Warwickshire Hospital,[1] which appears to be of a similar character. The case is published as one "of false diffused aneurism of the abdominal aorta, caused by caries of the vertebræ." The existence of an abscess in this case is not mentioned; but I presume, from the nature of the disease, and from the fact of several pieces of exfoliated bone being found lying loose among the coagula, that suppuration must have preceded the opening of the artery. The precise cause of the breach in the arterial coats, however, is not quite clear. A case is mentioned by Mr Miller,[2] (which is cited as "especially conclusive" on this point) "in which the aorta, when in contact with an unopened abscess, was found ulceratively eroded *from without*, the inner coat alone remaining, attenuated, yet entire."

Whilst, however, the cases which I have quoted seem to prove the occasional formation of this variety of aneurism, the possibility of its occurrence does not appear to be generally admitted as a pathological fact. The subject is not mentioned in most of the later works on systematic surgery; the fact of the occasional communication of the canal of an arterial trunk with the cyst of an abscess is indeed not admitted by some of the highest surgical authorities of the present day. This, I think, is probably to be explained by two circumstances:—1st, The rare occurrence of this form of aneurism; and, 2d, The difficulty of proving the order in which the pathological changes in the cyst and in the coats of the artery have occurred; the difficulty, in other words, of proving that the cyst was not originally that of an ordinary aneurism, in which suppuration has subsequently occurred; and this difficulty may have given rise in similar cases to the true nature of the aneurism being overlooked.

It is well known that the coats of an artery resist, longer than most other tissues, the morbid action by which surrounding textures are destroyed. In spreading ulcerations, however, the arteries frequently become involved in the morbid action, and their perforation gives rise to hemorrhage; and although they undoubtedly resist for long the ulceration of the tissues, by which an abscess extends its limits; yet there is no reason to believe that they may not at length suffer from the destructive action to which the surrounding tissues have more readily yielded. On this subject Béclard says:—"The external coat of the arteries long resists the morbid changes which are taking place around it. It is to be seen remaining entire in the midst of affections of long standing. * * * Occasionally, however, it

[1] London Journal of Medicine, January 1852, p. 35.
[2] Principles of Surgery, p. 212, foot note.

terminates by participating in the disease of the neighbouring tissues."[1]

The veins appear to participate in the ulceration of surrounding tissues more readily than the arteries; and various cases are recorded, where the venous coats have given way in the midst of an opened or of an unopened abscess, by which what may be termed a *venous aneurism* has been formed,—a lesion quite analogous to the form of arterial aneurism under consideration. Instances of this occurrence in the jugular veins, in cases of abscesses of the neck following scarlatina, have been frequently recorded.[2]

In the history of the following case, which has been lately under my care, and in the pathological appearances of the parts as seen on dissection, *conclusive evidence*, I think, is wanting to prove that the aneurism was of the variety described by Mr Liston. Although, however, as must frequently happen in similar cases, absolute proof of the nature of the tumour is wanting, the history of the origin and progress of the disease, the changes which the tumour underwent after deligation of the artery, taken along with the appearances found on dissection, are such as to leave no doubt in my own mind that the aneurism was one of secondary formation, and produced by ulceration of the coats of an artery, which formed part of the walls of an abscess.

Absolute proof of this view of the case being wanting, an attentive consideration of the details of the case is required before arriving at any conclusion on the point.

On the 16th of November last, I was requested by a friend to visit a young man, who had applied to him, on the previous day, for advice, on account of a pulsating swelling, presenting the usual symptoms of aneurism, situated beneath the right clavicle.

On visiting the patient, I examined the tumour with care, and found that it presented all the usual signs of aneurism. Mr Syme visited him with me on the same day, and had no difficulty in arriving at the same conclusion, all the symptoms of aneurism being strongly marked. The patient accordingly came to the hospital on the following day, for the purpose of submitting to the operation necessary for the cure of the disease.

The following account of the case is chiefly taken from my house-surgeon, Mr Moir's hospital journal:—

Dennistoun Marshall, æt. 29, married, but living separate from his wife, admitted into the Infirmary November 17, 1851, on account of aneurism of the right axillary artery. Has been for the

[1] Béclard—Addit. à l'Anat. Gen. de Bichat.

[2] London and Edinburgh Medical Journal, March 1843, p. 177. *Ibid.*, p. 386. *Ibid.*, July 1844, p. 632. A case by Dr A. M. Adams, of Glasgow, in which it is doubtful whether the vessel implicated was an artery or a vein.—*Ibid.*, April 1845, p. 265.

last four years employed as a japan-polisher,—an occupation in which continued active exercise of the right arm is required. He had formerly served for four years as a private in the 26th regiment in China, where he suffered severely from intermittent fever, from the effects of which, he thinks, his health has been permanently impaired. He states that he has never been free from cough since his return to this country. For the last three or four years he has led an irregular life, and about three years ago contracted syphilis, which was followed by the common train of secondary symptoms, sore throat, arthritic pains, skin eruption, and periostitis. Enlargement and induration of the cervical glands still exist, and his chest and back are still marked by a fading copper coloured eruption. He states that his cough was aggravated by his having caught cold in jail, where he had been confined for a month during last spring.

About the middle of June, after sleeping a whole night in the open air, and on damp grass, his cough became more troublesome, and he was seized with pain in the upper and fore part of the right side of the chest, and in the front of the shoulder, which was aggravated by taking a full inspiration. He did not apply, however, for medical advice, and continued at his employment up to within two days of his admission into the hospital.

Three weeks ago, he, for the first time, observed a swelling below the right collar bone, of considerably smaller bulk than the tumour which now occupies the subclavicular space. This swelling was not painful on pressure, and, as far as he is aware, was devoid of any pulsation. He did not pay much attention to it, and did not connect it in his mind with the pain of his arm till within the last three or four days, when the pain of the limb became much more severe, and he perceived a strong pulsatory movement in the swelling. He then for the first time applied for medical advice, when the nature of the tumour was recognised.

The symptoms which existed at the time of his admission into the hospital may be briefly stated as follows :—Severe and constant pain referred to the inner side of the right arm and fore-arm, but chiefly around the elbow. A circumscribed pulsating tumour, of the shape and size of a turkey egg, situated immediately below the right clavicle. The tumour occupied the situation of the first stage of the axillary artery, projecting immediately below the clavicle, and extending to the axilla, where it could be felt by the fingers pressed behind the pectoral muscle. The integuments covering the tumour were not tense, but marked by the course of two or three large veins. On slight examination, its consistence appeared to be tolerably firm; but on steady moderate pressure being made with the hand, its fluid contents gradually receded, till the swelling was nearly quite effaced. It immediately re-appeared with an expanding pulsatory movement on the pressure being removed. Pressure on the subclavian artery above the clavicle in the same way

speedily produced complete subsidence of the swelling, which again rapidly regained its former size on the finger being removed. On applying a stethoscope to the tumour, a loud *bruit de soufflet* was heard accompanying each stroke of the heart, and this was rendered more intense on allowing the tumour suddenly to re-fill after pressure being made on the artery above the clavicle. The brachial artery was felt pulsating feebly along the inner side of the arm, and the pulsation of the radial artery was scarcely perceptible at the wrist.

These symptoms being once distinctly recognised, I abstained from further manual examination, as the handling of the swelling gave him uneasiness, and as the size of the tumour appeared to be decidedly on the increase. My colleagues, Dr Dunsmure and Dr Gillespie saw him with me on the day following his admission into the hospital; but, on the above-mentioned account, refrained from making more than a very superficial examination of the tumour.

On examining the general state of the patient's health, his condition appeared to be unfavourable for the immediate performance of an operation. He had a depressed and anxious look. His pulse was about 90. His respiration was a little laboured, and he suffered from a constant tickling cough. The right side of the chest did not expand so freely as the left, and there was impaired resonance on percussion beneath the right axilla, extending for a considerable way back and in front, below the level of the tumour.

Under these circumstances, I requested my friend, Dr H. Douglas, to see the patient with me. Without entering into the details of the physical signs elicited on careful examination of the chest, I may mention, that Dr Douglas' report was favourable in so far as the state of the right lung was concerned. The cough appeared to depend on simple catarrh, of an unimportant nature; whilst the impaired resonance on percussion, and feebleness of respiration over a limited part of the right side of the chest, seemed to be the result of old disease (probably thickening) of the pleura. The action of the heart was regular, and its sounds normal; and no further disease of the vascular system could be detected. Under these circumstances, it appeared that the constitutional disturbance was chiefly referable to the local disease, the aneurism. The state of the chest was not such as, in Dr Douglas' opinion, contra-indicated the propriety of immediate operation; and as the tumour was distinctly increasing in size, and had already reached the level of the clavicle, I proposed to place a ligature on the artery without further delay,—a proposal which was willingly assented to by the patient, who was most anxious for the immediate performance of the operation.

The operation was performed on 19th November, in the usual way, a ligature being applied to the artery immediately to the outer side of the scalenus muscle. The operation was attended with unusual difficulty, from the number and size of the veins which

crossed the triangular space,—a difficulty which was fully verified on post-mortem dissection of the parts. I was efficiently assisted, however, in the deeper parts of the dissection by my colleagues, Mr Spence and Dr Gillespie, and the artery was, after some delay, reached and surrounded by a ligature, the sheath of the vessel having been freely exposed, but the coats of the artery denuded only to such an extent as to allow of the passage of the needle. The patient was in the recumbent posture during the performance of the operation, and did not inhale chloroform. He bore the operation admirably, and when it was finished he walked down stairs to his ward.

During the first five days succeeding the operation, everything progressed favourably. The pulse averaged from 72 to 88, and his cough was decidedly better. The aneurism had diminished to less than a third of its former size, and I repeatedly pointed out to the students of the hospital this unusually rapid subsidence of the tumour.

On the 24th (fifth day after the operation), the pulse was a little accelerated, and he did not feel quite so well. His cough, however, was better, and he made no special complaint.

On the evening of the 25th, he had an attack of shivering, followed by heat of skin and general fever; and on the 26th I found him labouring under acute general bronchitis, with a rapid and feeble pulse and considerable dyspnœa, with slight lividity of the lips. He was occasionally incoherent, his skin was covered with perspiration, and his sunk and anxious look was such that I did not expect he could survive long.

Under the free use of stimulants and opiates, together with the application of a large blister over the fore part of the chest, his condition improved; and on the 30th, under the kind and skilful management of Dr Douglas, his alarming chest symptoms had very much subsided. The dyspnœa and cough were greatly relieved, and his pulse had again fallen below 100, whilst at the same time it had improved in strength. The ligature was found loose on the dressings on this, the eleventh day following the operation; the wound having been entirely healed for two or three days previously, except at the point where the ligature protruded.

After this, he continued to improve steadily. On the 5th of December he was so well as to be able to be out of bed for half an hour. The wound was healed, with the exception of a point not larger than a pin's head, from which there was scarcely sufficient discharge in twenty-four hours to moisten the morsel of lint placed over it. The prominence of the tumour was almost entirely effaced, but it wanted the dense feeling of a solidified aneurism.

Since the day following the application of the blister to the chest, some enlarged glands had been felt in the axilla, indurated, and a little painful on pressure. There was now a larger and softer swelling to be felt deeper in the axilla, behind the pectoral muscle, which

I thought probably depended on suppuration of some of the deeper glands, from the irritation of the blister, which was a large and exceedingly severe one, and still continued to discharge.

Early on the morning of 6th December, slight oozing of dark-coloured blood took place from the small opening in the middle of the cicatrix, but soon ceased spontaneously.

On the afternoon of the same day, a small jet of arterial blood again issued from the same point, but the bleeding was arrested by slight pressure.

On the 7th, at three A.M., the bleeding recurred to a slight extent. The cicatrix was now of a dark colour, and stretched by effusion of blood beneath it. Oozing of blood continued through the day, in spite of careful compression, and the continued application of cold.

At four o'clock on the morning of the 8th, a fit of coughing was suddenly followed by copious hemorrhage. On arriving at the hospital, I found the patient in a very weak state, having lost about a pound of blood. I learnt from Mr Moir that the whole adhesions of the wound were broken up, and that the hemorrhage was now restrained by a graduated compress, introduced to the bottom of the wound. The hemorrhage was in the meantime effectually suppressed. A few strips of adhesive plaster were drawn across the compress, to prevent its being displaced, and a bladder of ice was applied over the parts.

It was now evident that nothing but the application of a ligature to the subclavian, inside the scalenus, or to the innominate artery, could prevent the patient from speedily sinking from hemorrhage; but I need scarcely say, that the condition of the patient precluded all idea of resorting to such an attempt.

By the attention and constant watching of Mr Moir and my clerk, Mr Watson, no copious hemorrhage again occurred. The blood continued, however, to ooze in small quantity through the dressings; and the patient gradually sank, and died at three o'clock on the morning of the 10th December.

The body was examined on the following day. The entire parts concerned in the disease and wound over the clavicle were removed for careful examination. This was done by dividing the soft parts transversely in the upper part of the neck, downwards over the shoulder, and along the posterior border of the axilla. The trachea and œsophagus were included within the incisions; the sternum divided longitudinally, and the three first ribs removed in connection with the parts.

In thus exposing the right side of the cavity of the chest, it was found that the lung was universally attached to the thoracic walls by old and firm adhesions, except from within a very short way from its apex to the level of the fourth rib. This space was converted into an abscess, which extended, about the same level, forwards as far as the costal cartilages, and backwards to within two inches of the angles of the second and third rib. The second rib

lay bare, and at points eroded, in the cavity of this abscess for about four inches, as well as a small portion of the lower border of the first rib. The quantity of pus contained in this abscess appeared to be about four or five ounces. The abscess appeared to have had its origin between the walls of the thorax and costal pleura. This was thought probable, from the ribs and intercostal muscles being completely separated from the membrane, whilst the surface of the lung was still covered by a dense and thickened layer, formed apparently by the adherent and thickened costal and pulmonary pleura.

The tissue of both lungs was healthy throughout, except the upper part of the right lung, which did not crepitate on pressure quite so freely as other parts of the lung. The bronchi and their ramifications were universally slightly congested, and contained a considerable quantity of mucus. The heart was in all respects healthy, and no trace of disease could be detected in any part of the arterial system.

The parts concerned in the local disease were examined, by first exposing the wall of the cyst, and laying bare the artery upwards from beneath the origin of the large branches in the axilla. The cavity of the sac was then laid open by an incision through its anterior wall, in a line with the course of the artery. On doing this, about an ounce of pus escaped, mixed with one or two small recent coagula; and so little did the interior of the cavity present of the appearance of an aneurismal sac, that I was at once impressed with the idea that no aneurism existed, but that an error in diagnosis had been made; that the disease was simply an abscess, which had received a pulsatory movement from its contact with the artery. On reflecting, however, for a moment on the unequivocal nature of the symptoms, and on the speedy and great diminution of the size of the tumour after the application of the ligature, I was satisfied that this could not be the case.

On washing gently the inner surface of the cavity, it was seen that the greater part of its surface presented the loose flocculent appearance of an abscess; that a small portion of the lower border of the first, and the second rib to the extent of between three and four inches, were bare, and at some points rough, from destruction of their lamellated surface, and that a large communication existed in the second intercostal space between the cavity and the abscess within the chest. Here and there the surface of the cavity (especially on its anterior wall) was lined by patches of fibrinous deposit, adherent to the walls of the cyst, and quite similar to the laminæ of fibrine deposited in the interior of the sac of an aneurism.

A probe was now introduced into the divided extremity of the artery below, and passed upwards with great gentleness till it had reached about an inch beyond the lower limits of the sac, when it at once passed into the cavity of the cyst. The probe was immediately withdrawn, and the opening in the artery was seen to be of

an oval form, and about two lines in its longest diameter. The edges of the opening were well defined, but, as well as the arterial coats in its close neighbourhood, were soft, almost pulpy, and very thin. The opening and its edges, indeed, resembled in all respects the perforations of two arteries in my possession, which had given way into the cavity of abscesses, which had been opened a short time previously.[1]

On passing a longer probe into the artery from below, and avoiding the opening I have described, the coats of the artery were found to be entire for nearly an inch and a half beyond the opening. Here the passage of the probe met with an obstruction, which, however, was overcome without using much force, and the point of the probe, pushed gently forwards, entered the sac near its upper part.

As it was impossible to expose this second opening without further dissection, it was not so carefully examined as the lower opening, in order that an accurate sketch of the parts might be made before they were further displaced. On dissecting the artery further, after the parts had been for some time immersed in spirit, the tissues were found matted together in the walls of the abscess, and it was difficult to ascertain the precise condition of the parts. The artery was obliterated from within an inch and three quarters of the lower opening up to the point of ligature. The coats of the artery for half an inch below the obliterated portion were softened, and the canal of the artery contracted in size. The appearance of the opening in the vessel here was quite different from that of the lower perforation. It was evidently an artificial opening, and made by the probe at the point where its passage had been obstructed; but so slight was the force which had caused the probe to enter the sac, that I think a perforation had probably existed at this point, previously to the performance of the operation, and had been closed by the contraction of the artery, and by the recent effusion of lymph succeeding the application of the ligature. Of this, however, there is no certain proof.

On examining the wound over the clavicle, after it had been cleared of the coagulum, with which it was distended, it was found to have no communication with the aneurismal cavity, being separated from it by the subclavius muscle and costo-clavicular ligament, which remained entire. This had been rendered evident in the early stage of the dissection; had any communication existed, the blood, pent up by the plugging of the wound, must have escaped into the sac, which was not the case.

The artery was found quite disorganised above the seat of ligature. The hemorrhage had occurred from the proximal side of the

[1] Perforation of the popliteal artery, already mentioned, and a perforation of the trunk of the lingual artery, in the cavity of an acute abscess of the pharynx, which had been opened four days previously to the occurrence of hemorrhage.

point at which the ligature had been applied. A firm clot, of about half an inch in length in great part, but not entirely, filled up the canal of the vessel at this part, and adhered firmly to the walls of the vessel, except on its upper side, where an opening existed, through which a crow-quill might have been easily passed. The nearest branch to the point of ligature was the internal mammary, which was given off about three-quarters of an inch from the point at which the artery had been tied. The artery on the distal side of the point of ligature (as already mentioned) was obliterated and already converted into an impervious cord. It adhered intimately to the coverings of the rib, at the point where the ligature had divided the vessel.

Lastly, the veins running over the surface of the tumour and the trunk of the internal jugular vein, showed signs of recent inflammation, the canal of these vessels being partially obstructed by fibrinous deposit and coagula adherent to the walls of the vessel. The veins engaged in the wound over the clavicle did not present any morbid appearance. The subclavian vein was pervious between the upper margin of the first rib and its junction with the jugular vein, but was completely disorganised and divided at the point opposite the ligature of the artery. This had evidently been produced by the firm plugging of the wound for some days before death, by which the vein had been, along with the artery, forcibly compressed against the rib.

A remarkable variety existed in the position of the subclavian vein. It lay immediately below, and in contact with the artery, and behind the scalenus anticus muscle. It diverged from the artery behind the scalenus to join the internal jugular vein.[1]

An attentive consideration of these details can scarcely fail, I think, to lead to the conviction, that the aneurism was of the variety described by Mr Liston; that it owed its origin to ulceration of the coats of the artery, which formed part of the walls of an abscess.

Another view of the case, however, has been taken by some, who have examined the parts, and on whose opinion I place much reliance, viz., that the tumour was originally a spontaneous aneurism, and that suppuration of the sac had taken place, and given rise to the appearances which were found on dissection.

A third view of the case has been suggested, and which I consequently think it right to mention, viz., that the disease was simply abscess, and that the diagnosis of the case from first to last was erroneous.

There seems little difficulty in refuting this last opinion, which does not appear to me to be borne out by a single fact in the case, beyond the presence of pus in the cavity.

[1] As far as I am aware, two cases only of this variety of the vein have been previously recorded. Blandin.—Traité d'Anatomie Topographique, &c., p. 210. Velpeau.—Traité Complet d'Anat. Chirurg., tome i. p. 494.

Following the view which I have adopted, the symptoms from which he suffered are easily accounted for in the order in which they occurred. In the month of June, after unusual exposure to cold from sleeping all night on the damp grass, he suffered from an aggravation of his cough, accompanied with pain high on the right side of the chest, and in front of the shoulder. These symptoms continued unabated, and, it seems reasonable to conclude, were produced by the formation of an abscess of the pleura, which was limited by extensive old adhesions of the lung to the walls of the chest. For four months he continued to suffer from these symptoms, and at the end of that period he for the first time perceived a swelling beneath the collar-bone, which gradually went on increasing in size, but, as far as he was aware, was devoid of pulsation. The matter within the chest, limited by the adhesions of the pleura, had made its way outwards through the intercostal space, and burrowed in the cellular tissue beneath the pectoral muscles. That the matter had been in contact with the ribs for a long period is proved, I think, by the bare, rough, and macerated appearance of the bones. The matter, in its further progress to the surface, made its way from beneath the pectoral muscles, and burrowed in contact with the axillary vessels in the highest part of their course, and the artery, thus lying bare in the cavity of the abscess, had at length given way, probably two or three days only before his admission into the hospital, the period at which he first observed pulsation in the tumour. The cavity of the abscess was thus suddenly changed, by its communication with the artery, into a false aneurism.

Taking the other view of the case, viz., that the aneurism was the primary formation, and that the sac had suppurated, it becomes a much more difficult matter to account for the changes which took place in the tumour during life, or for the appearances found on dissection. Inflammation of an aneurismal sac, in the first place, is attended by severe pain and constitutional disturbance, and by rapid increase in the size of the tumour; but, in this case, neither pain, increase in the size of the tumour, nor any signs of inflammation, occurred after the application of the ligature, the period during which, it is thought, suppuration occurred. On the contrary, the subsidence, the almost entire disappearance, of the tumour after the operation, was unusually rapid; and firm pressure over the seat of the swelling gave no pain.

Again, supposing the aneurism of the axillary artery to have been the primary formation, it is difficult to imagine how the progress of the tumour should have been towards the cavity of the chest, and not towards the surface below the clavicle, or downwards into the loose cellular tissue of the axilla. Such an extension of an axillary aneurism is quite unusual, and, I think, highly improbable.

In the next place, the interior of the cavity presented none of

the appearances which are found in the cavity of a spontaneous aneurism, which had undergone suppuration. There were no broken-down masses of fibrin, nor appearance of concentric laminæ, which are invariably present in such circumstances. On the contrary, there were, as in Mr Liston's case, only patches of fibrinous deposition adhering to the sac at one or two points.

Further, the opening of communication between the artery and the cavity presented none of the appearances of the opening of a spontaneous aneurism. It was not a thickened everted opening, with adherent fibrine, nor was there the slighest extension of the external or inner coats over the walls of the sac. On the contrary, the edges of the opening were soft and pulpy, and the perforation of the coats was abrupt and defined.

Lastly, spontaneous aneurism does not often occur without more or less general arterial disease; but in this case, with the exception of the right axillary artery, the arterial system was perfectly healthy throughout.

I have said that it had been suggested that the disease may have been a simple abscess, and that the pulsation may have been communicated from the neighbouring artery.

In answer to this supposition, it may be stated, in the first place, that the signs of aneurism were *most unequivocal.* One of the signs, however, in this case was not to be depended on, viz., the emptying of the tumour by pressure made on its surface. Supposing the disease to have been only abscess, the pressure would have caused the matter to recede into the chest through the intercostal opening. The removal of the pressure, however, was instantly followed by the peculiar expanding pulsation characteristic of aneurism, and was accompanied by a loud *bruit de soufflet.*

But one well-marked symptom was present, which alone precludes the idea of the disease being a simple abscess. Pressure on the subclavian artery over the clavicle not only arrested the pulsation of the tumour, it produced remarkable subsidence of the swelling,—so much so, that Mr Syme remarked, whilst compressing the subclavian artery alone with the finger, that "the tumour was gone." This could not have occurred had the disease been a simple abscess. The tumour instantly refilled on removal of the pressure on the artery.

Lastly, if the tumour was only an abscess, the ulcerated opening of the artery must have taken place after the operation, at a time when the artery was collapsed and empty, and obliterated to within two inches of the opening.

This view of the matter is so extremely improbable, that I need scarcely say more to refute this opinion. Were further proof wanted, it is to be found in the well-marked patches of fibrinous deposit adhering to the walls of the sac.

One feature of the case, as regards the ligature of the artery, is worthy of notice, viz., the occurrence of secondary hemorrhage so

long as six days after the separation of the ligature, and at a time when the wound was firmly cicatrised, except at a point not larger than the head of a pin. The danger of secondary hemorrhage seems to be not only greater, but also to continue for a longer time, in the arteries, the current in which is so directly under the influence of the heart's action as those at the root of the neck. There was the additional unfortunate complication in this case of severe fits of coughing. But one cause of the hemorrhage in the present case, I think, was the application of a large blister to the upper part of the chest about the time of the separation of the ligature, which probably caused partial absorption of the newly exuded lymph, which closed the vessel, a risk which was fully estimated before the use of a remedy, which, however, Dr Douglas considered indispensable in the treatment of the bronchitic attack.

The importance of the subject is, I think, sufficient apology for my having entered somewhat minutely into the details of this case. Instances, in which pathological proof of this form of aneurism can be obtained, are necessarily rare, and it is, consequently, of moment that they should be carefully recorded.

There seems to be one important point in practice involved in the consideration of this variety of the disease, viz., the question of operative interference.

The ordinary Hunterian operation (the application of a single ligature to the artery between the aneurism and the heart) can, I think, scarcely be relied on with any degree of certainty to effect a cure of such an aneurism. There is not in these cases, as in spontaneous aneurism, the thick deposit of fibrinous layers within the sac, which rapidly increases in ordinary cases after the application of the ligature, till the tumour is filled by solid matter. On the contrary, the operation cannot be followed by solidification of the tumour, unless absorption of the purulent matter takes place,—an event which can scarcely be looked for in such cases. The matter, then, will make its way to the surface, and, unless the artery has been obliterated at the point of the ulceration of the vessel (which is a matter of uncertainty), hemorrhage will take place on the matter making its way through the integuments. The condition would be the same as that of an aneurism, which had undergone suppuration after the performance of the Hunterian operation: the collateral circulation in a state of increased activity, and bringing the blood freely round to the hole in the artery.

Were the character, then, of such an aneurism recognised during life, it appears to me that it would be better practice to treat the case like any other form of false aneurism, viz., by the performance of the old operation,—the laying open of the tumour, and the application of two ligatures, the one above and the other below the opening in the vessel.

The prognosis, however, in such a case, under any circumstances, must be unfavourable; an artery involved in the cavity of an ab-

scess not being in a condition favourable for the occurrence of the healthy changes necessary for its obliteration, by the application of ligatures in the neighbourhood of such an ulcerated opening.

EXPLANATION OF PLATE.

A A A A. The cyst.
B. The axillary artery.
C. The opening of communication between the artery and cyst.
D. The second rib bare and rough.
E E. Patches of fibrine deposited in layers on the interior of the cyst.
F. Arteria innominata.
G. Carotid artery.
H. Subclavian artery on the proximal side of the seat of ligature; a probe passed through the vessel to show the source of the hemorrhage.
I. Internal mammary branch.
J. Transverse humeral branch.
K. Omo-hyoid muscle.
L. Scalenus anticus reflected.
M. Internal jugular vein reflected.
N. Sterno-mastoid reflected.
O. Pectoral muscle cut across.

ARTICLE IV. — *Contributions to Toxicology.* By DOUGLAS MACLAGAN, M.D., F.R.S.E.

Poisoning with Arsenic; Recovery from a Large Dose; Magnesia as an Antidote; Period of Elimination of Arsenic from the System.

ON Tuesday, 4th November, I was requested by Dr Graham Weir to see Margaret Davidson, æt. 35, a poor creature, long a well-known hospital and dispensary patient, who has for years been in a state of great debility, both bodily and mentally, from hysteria. This day, 4th November 1851, at a little before three P.M., she swallowed half a dessert-spoonful of a white substance, which she supposed to be a saline powder. She mixed it with water in a jelly-can, and observed that it did not effervesce as she expected, but ascribed this to her having used too small a quantity of water. She did not perceive any effect from it whatever for at least half an hour (more probably three-quarters of an hour, as appeared from comparing her father's statement with her's), and then she experienced some sickness. It was, however, not great. She remained up to this time in ignorance of her having swallowed anything deleterious, and would probably not have discovered it at all, but for the following trifling circumstance:—she noticed her dog pulling about the piece of paper from which she had taken the powder, and which she had thrown on the floor after swallowing the supposed medicine; then, to her horror, discovered that it bore in large letters, "Arsenic, poison," and she recognised it as the wrapper of a parcel of arsenic which her father had procured about a

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year before for poisoning rats. The sickness which she had experienced had been succeeded by vomiting; and being now (four P.M.) thoroughly alarmed, she procured the help of an apothecary's assistant who lived in the flat above. He advised her to encourage the vomiting by draughts of warm water; but as she became gradually worse, he summoned Dr Weir, who lived in the neighbourhood. Dr Weir saw her at seven P.M., and I saw her along with him in an hour afterwards. She then presented the symptoms of irritant poison. She had incessant vomiting of thick tenacious mucus, tinged slightly green from bile, and depositing a white sediment; intense thirst, and great pain in the stomach and bowels, but she did not complain of its being aggravated by pressure. She had had no purging up to this time. The face and extremities were cold, the eyes sunk, and surrounded by a dark areola, and the face pale, except during the acts of vomiting. The tongue was red at the tip, with prominent papillæ; but this appearance, as I afterwards learned, was constant in her. Her pulse was 120, and small.

The whole train of symptoms, backed as they were by the exhibition of the printed label, and the jelly-can having the remains of a white powder in it, left little doubt that the case was one of arsenical poisoning. Nevertheless, as the girl was a weak-minded hysterical patient, and had frequently suffered violent and anomalous ailments, and as, moreover, from the freedom of the vomiting, little required to be done upon the instant, I took the opportunity of determining positively that it was a case of arsenic. I therefore carried to a neighbouring druggist's shop a portion of the vomitings ejected in my presence. I there procured a Florence flask, some muriatic acid, a bit of copper wire, and a test-tube, and in less than ten minutes, by Reinsch's process, obtained an abundant sublimate of arsenious acid from the vomitings.

Dr Weir, previously to my arrival, had sent for a supply of "Ferrugo," but, though several laboratories were applied to, none was to be found ready. Under these circumstances, it was determined, instead of preparing the hydrated sesquioxide by precipitating a quantity of the tincture of muriate of iron, to give a trial to the other reputed antidote of arsenic, magnesia. I therefore returned to the patient, carrying with me four ounces of light magnesia. I stirred it in as much water as gave it the consistence of thick cream, and administered the magma at intervals of some minutes, in doses of two or three tablespoonfuls. It was generally vomited as soon as swallowed, the vomitings being quite white from magnesia. There was some difficulty in getting her to take it, as she thought that it was the cause of her vomiting; but by dint of some persuasion this was accomplished, and in the course of three-quarters of an hour she took the whole four ounces, and I have little doubt vomited it all up again. No further treatment was pursued that night, than applying heat to the extremities, a

large sinapism to the belly, and allowing, at her request, cold water in restricted quantities, not more than a wine glassful at a time, to relieve the intense thirst.

November 5th.—Has vomited all night, and still does so, but at longer intervals. She has since midnight had several loose stools, with slight heat at the anus. Has passed no urine since swallowing the poison, and it was ascertained by the catheter that the bladder was empty. She lies in a drowsy, torpid condition, eyes sunk, face blue, and, like the extremities, cold and clammy. She presented the most perfect resemblance to a case of Asiatic cholera in the stage of collapse. The pulse 120, very small; the tongue was red on the edges, with a peculiar white crust in the centre. She complained now of burning heat in the throat and mouth, and much tenderness of the belly. She was, at her own request, allowed butter milk as drink, and she was ordered a solution of five grains of nitrate of potash in ℥i. of mucilage every two hours, and to have two teaspoonfuls of gin at the intervening hours.

Same evening she appeared much worse, the drowsiness was greater, the pulse feebler, the eyes injected. She had, at intervals, vomiting, with much flatulent eructation during the day, and thought this was caused by the nitre. There was no more diarrhœa; still no urine. A teaspoonful of spirit. etheris nitrici, with an equal quantity of spirit. ammoniæ aromaticus was given in mucilage instead of the nitrate of potash, and a large blister was applied to the epigastrium. She appeared to me to be gradually passing into a state of coma, and I thought that she was dying.

6th.—She was this morning in a state of re-action, the skin having become warm and moist; the pulse 96, soft; and she had passed four ounces of urine early in the morning, the suppression having thus lasted about thirty-six hours. She had some return of diarrhœa. In the evening the skin was hot and dry, the pulse 120, rather full, and she had been vomiting some green bile, mixed with dark patches, apparently of grumous blood. The sweet spirit of nitre, but without spirit. ammoniæ, and gin, in mucilage, were continued.

The urine passed this morning was examined chemically. It was deep brown, of density 1015, and strongly acid. It gave a large amount of albumen on heating, and a copious deposit of purpurine on the addition of hydrochloric acid to it when warmed. It was placed in a Marsh's apparatus, and gave a copious arsenical crust.

7th.—Some vomiting this morning; no stool since last night, but has passed six ounces of urine, which, by mistake, was not kept. She does not complain of tenderness on pressing abdomen. Pulse 120, small. She is exhausted, but not drowsy. Continue spirit. etheris nitrici and gin.

8th.—Has passed twenty ounces of urine since yesterday morning; vomiting diminished; little or no tenderness of abdomen; no

diarrhœa; pulse 96, full; tongue red on edges, but covered in centre with a dense white crust, like that of diphtherite. She was allowed a few spoonfuls of strong beef-tea, the gin and spirit. etheris nitrici were stopped; and as she was restless at night, she got half a drachm of solution of morphia.

The urine was found to be highly albuminous, and twelve ounces of it, by Marsh's process, yielded a copious arsenical crust.

9*th*.—Has had little vomiting, and no stool since day before yesterday. Is stated to have passed about thirty-six ounces of urine. Pulse 90, of good strength; eyes injected, but whole expression is livelier. Bowels relieved of some fæces and much flatus by an enema. ʒss. solution of morphia at bed-time.

The urine of this date was albuminous, but not so much so as before; ten ounces of it gave, by Marsh's process, a rather decreasing but still considerable crust of arsenic.

10*th*.—No vomiting. One easy stool. Copious urine. The white crust is peeling from the tongue, which is of a bright red, and glazed. She is very deaf. Pulse 90. Beef tea and calf's-foot jelly allowed her in small quantities, and a few spoonfuls of gin. A gargle of acetate of lead, with tincture of opium, for the mouth, which is very tender. ʒss. morphia at bed-time.

11*th*.—Tongue red, and free from crust, but not so tender. No vomiting nor purging during the night. During the day, she was seized with vomiting, and brought up about ten ounces of a dark grumous bloody fluid; but there was no tenderness of abdomen. She has some cough, which, as well as the vomiting, she ascribes to the room having been filled with smoke. The pulse rose to 120 before night, and the skin was hot, but she had had no shivering.

12*th*.—No vomiting, but has extensive bronchitis, sonorous and sibilant râles being heard over the whole of both lungs. Pulse 120; less thirst; copious urine reported, but not kept. Stimulants withdrawn, and a pil. ipecac. et opii. every two hours.

13*th*.—Had a good night, but some vomiting after taking the pills. Bronchitic sounds are diminished; no moist râles. Bowels moved once, and a considerable quantity of urine passed. Takes soup and jelly well. To take, instead of the pills, eight minims of ipecacuan wine, with five of solution of morphia, every two hours.

The urine of this date was of density 1019, and was full of blood, coagulating copiously by heat, and showing numerous blood-corpuscles under the microscope. Twelve and a-half ounces, subjected to Marsh's process, gave a considerable arsenical crust.

16*th*.—Notwithstanding the attack of hæmaturia, she has continued to improve steadily since last report. The urine of this date is of density 1020, free from bloody colour, and showing no corpuscles under the microscope, but abundantly coagulable. Twenty-four ounces of it were concentrated, and subjected to Marsh's process, but no arsenic was detected.

19*th*.—Has improved generally since last report, but urine has

been scanty, notwithstanding the use of some doses of spiritus etheris nitrici. To-day she complains of pain in the loins, aggravated by pressure over the kidney. There is no vomiting. Hot fomentations with turpentine to the loins.

Twenty-four ounces of the urine of this date gave, by Marsh's process, a small but very distinct crust of arsenic.

21*st.*—Has incontinence of urine, and complains of severe pains in the thighs and legs, with numbness of both feet, and inability to use the limbs. Bowels, which have been constipated, relieved by a colocynth pill. To take twice daily, a pill, containing two grains of sulphate of quinine, and half a grain of extract of nux vomica.

23*d.*—Has rather more command of bladder; but pain and numbness of legs continue. Is obliged to get morphia to procure sleep.

25*th.*—Incontinence gone, but pain and numbness as before. The nux vomica stopped, as she complains of jerking and cramps in the legs, though this probably was not due to the medicine.

Twenty-six ounces of the urine of last night, by Marsh's process, gave a faint arsenical crust.

29*th.*—Continues to improve. Twenty-six ounces of this day's urine examined as before, but no trace of arsenic detectable.

The case need not be reported further. She has continued up to this time (16th January) very much in the same condition, complaining still of a numbness, and of occasional severe pains in the legs; but these are evidently hysterical symptoms, and in fact she is now as well as she has been for some years, or probably as she ever will be.

I have a very few remarks to offer on this case. It is interesting, as adding another instance to the many already on record of recovery from a pretty large dose of arsenic. In order to acquire some idea of the probable amount swallowed, I went to the girl, since her recovery, taking with me a parcel of arsenious acid, and caused her to measure out in a spoon, as nearly as she could, the bulk which she swallowed. On weighing this, I found it to be 132 grains; deducting, therefore, the odd grains, we have, in round numbers, two drachms as the quantity most probably taken by her.

In relation to the question as to the taste of arsenic, I inquired of her, as soon as she was sufficiently recovered to answer such questions, what her impression was as to its taste; and her reply unhesitatingly was, that it was sweetish, and that it produced no sense of irritation in the mouth or throat, until the succeeding morning.

The diagnosis here was, practically, not a matter of any difficulty. It was founded essentially upon the agreement of the symptoms with the girl's own statement that she had swallowed arsenic. It was, however, confirmed and rendered indisputable by the application of Reinsch's process to the vomitings; and, without attaching

too much importance to the particular treatment followed here, yet I may observe, that it was adopted and persevered in mainly upon the positive assurance, which the analysis of the vomitings gave, as to the real nature of the case, and that whether the recovery is to be called its effect or no, it was, at all events, its sequence. I am not aware of having observed that Reinsch's process has ever been applied as a means of diagnosis, but assuredly in doubtful cases it is susceptible of such application; and it would certainly be satisfactory to a medical practitioner, called to a case which should afterwards prove fatal, and be determined by post-mortem analysis to be one of poisoning, that he had positively assured himself of this during the life of the patient, and had treated it as such. In relation to cases of recovery, it might also be not without its use, as enabling us to judge of the value of any particular treatment. Many of the observations adduced as testimony to the powers of an antidote are rendered worthless, by its not having been positively ascertained that the poison really had been swallowed. An instance of this exists in the last Number of this Journal (p.87), respecting a recovery, by the hydrated oxide of iron, of a supposed, but most improbable, case of poisoning by arsenic. The application of Reinsch's process to a portion of the vomitings, during the progress of the case, offers no practical difficulty,—it will, in general, be easy to procure the materials, and, of course, absolute purity in the hydrochloric acid is not required here, as in a strictly medico-legal analysis. In no town, scarcely in any village, would it be difficult to find some "spirit of salt," and a bit of copper; the glass tube for sublimation is, in reference to diagnosis, unnecessary. If the piece of copper be crusted black during the boiling, and when heated in a candle lose its crust, and give off alliaceous fumes, the evidence will be sufficiently precise.

The result of this case entitles us to place it among the facts adducible in support of the employment of magnesia as a remedy in arsenical poisoning. I do not say as an antidote in the chemical acceptation of the word, because the doses of magnesia remained so short a while in the stomach, that it could hardly have time to form an insoluble compound with the arsenic, admitting that it is capable of so doing, of which the experiments of Bussy and Christison leave no doubt. My own impression at the time was, that if the magnesia had any special effect at all relative to the poison, it was chiefly mechanically, by enveloping the particles of arsenic, and, emetically, by exciting the vomiting, and thus procuring the speedy ejection of the poison from the stomach. I am not disposed, in reference either to this or any other case of arsenical poisoning, to maintain that the magnesia (and the same remarks apply to the hydrated oxide of iron), if its use be followed by success, acts purely as a *chemical* antidote, because, as has been shown by Dr Taylor, in his able discussion of this subject, in his book on "Poisons," these

agents do not affect the solid arsenic in the stomach, but only precipitate, and that to a small extent, the arsenic that is in solution. At the same time, it is a fact not to be entirely lost sight of, that both ferrugo and magnesia do, when given in large quantity, form insoluble compounds with arsenious acid. My own experiments [*Edin. Med. and Surg. Journal*, liv.] point to twelve parts of the oxide ; and Dr Christison's [*Monthly Journal*, August 1846], to twenty-five and upwards, of magnesia to one of arsenic, as the proportions requisite to effect this precipitation. Whilst, therefore, I do not look upon ferrugo and magnesia as antidotes to arsenic in the same chemical sense in which chalk is to oxalic acid, and whilst I believe that a great part of their supposed beneficial effects is to be ascribed to their mechanical action upon the undissolved arsenic, I am not inclined to throw their chemical behaviour to the poison entirely overboard ; and I therefore cannot entirely subscribe to my friend Dr Taylor's remark, that whilst "as a bulky mass it may serve mechanically to suspend the poison, and thus facilitate its ejection from the stomach, it possesses no advantages over albumen or other viscid liquids." [*Poisons*, p. 334]. It must be remembered, that the arsenic which enters the circulation, and which is the real source of the danger, is in ponderable quantity by no means great. That, therefore, a very small quantity rendered insoluble becomes of importance to the safety of the patient. Further, the "danger in the absorption of poisons appears to arise less from the absolute quantity taken up by the blood, than the quantity admitted into the circulation at any one time" [Taylor] ; and that therefore any means which can, even to a trifling extent, diminish absorption at the time that it is going on most actively,—*i.e.*, when the stomach is full of poison, may be of consequence. The *chemical* value of the antidote ought, I think, to be viewed, not, as is generally done, in relation to the dose swallowed, but in relation to the quantity undergoing absorption at the moment; and if two or three grains of arsenic absorbed be enough to peril life, two or three fractions of grains kept out of the blood may be of no small consequence in relation to the chances of recovery. I attach no importance to the objection, that those compounds formed with arsenic by the oxide of iron and the magnesia, are soluble in the acid juices of the stomach. There can be no free acid capable of effecting such a solution in the secretions of a stomach which is filled with basic matter, such as oxide of iron or magnesia. It is perhaps by its neutralising the gastric acids, that the moist oxide of iron prepared by ammonia, a little of which it always retains, is superior to the oxide prepared in other ways, or dry.

The above considerations, in connection with this additional case, where the use of magnesia was followed by recovery, and the fact, that neither it nor the oxide of iron do any harm, ought therefore, I think, to encourage us to use these reputed antidotes freely, provided always that where vomiting is not going on, these are not

relied upon to the exclusion of the infinitely more important object of getting the poison out of the stomach.

As regards the diuretics used, I may observe that their employment was had recourse to, not so much upon the idea of eliminating arsenic through the kidneys, as in remedying the suppression of urine,—itself a grave enough symptom, whether in connection with arsenical poisoning or not. At the same time, it was considered that as the poison was by this time probably entirely expelled from the stomach, and as one, and that perhaps the chief, emunctory, by which absorbed arsenic is eliminated from the system, was thus closed, the diuretics might be of service in freeing the system from some part of the arsenic, as well as from the suppressed renal secretion.

To one other point in this case I have to direct attention, and that the only one connected with it having much medico-legal interest. The period required for the complete elimination of arsenic from the body has been a matter of much discussion, and has, I suspect, been made the subject of dogmatical statements entirely unwarranted. It has confidently been asserted by Flandin and others, that fourteen days is the extreme period during which absorbed arsenic will remain in the living body; but as Taylor properly remarks:—"Observations are neither sufficiently numerous nor accurate to justify our fixing so close a limit." Cases of recovery or protracted survival from large doses in the human subject, on which alone such observations can be made, are by no means common; and experiments on other animals are worth nothing in relation to this question. It was my intention, so soon as any urine began to pass at all, in this case, to examine it so long as the girl lived, as a matter of physiological interest, for I had not much expectation of her recovery; but as the case went on, I resolved to try it in relation to the medico-legal question, as to how long after the administration of the poison, in a case of survival, arsenic may exist in the body. I was, however, at the very period when this case occurred, not only much occupied with other professional matters, but the time that I could spare in my laboratory was engrossed by two criminal cases of arsenical poisoning which were then under investigation. I was therefore enabled to make a much smaller number of analyses of the urine than I could have desired. They were enough, however, indubitably to establish the fact, that arsenic may be found passing out of the body on the *twentieth* day after swallowing a large dose of the poison. I need hardly remark, that this being a case of purely accidental poisoning, and there being therefore no homicidal or suicidal intent, there was no moral ground for fancying that any arsenic was introduced into the system after the one dose, nor did the symptoms warrant such a supposition. Further, that the materials which I employed were of absolute purity, prepared and repeatedly tested by myself, and that therefore there can be no fallacy as to the source of the arsenic

found in these experiments. Moreover, as the arsenic was collected in the metallic form, in tubes of nearly equal size, I was enabled to judge of the proportionate quantity obtained on each trial; and there was a gradual declension in its amount, exactly as might have been expected, as the result of its elimination from the body. It will be observed, that on one occasion (the 12th day of the case) I failed to detect arsenic, but in that instance I must acknowledge that the experiment had not justice done to it, from the other more important matters which pressed upon me at the moment.

At any time, positive results are of more weight than negative; and from these experiments we must, I think, pause ere we give our assent to the doctrine, that fourteen days is the limit to the residence of arsenic in the living body. For the medico-legal bearings of this question, I refer to the well known case of Lacoste.—*Vide* Taylor, p. 363.

For the following case of poisoning by arsenic, with a less fortunate result than in that just related, I am indebted to my friend Dr W. Robertson, who has kindly furnished me with the account of it.

Suicide by Arsenious Acid—Death on the 4th day—Post-mortem Examination.

Margaret Branaghan, æt. 27, was admitted into the Royal Infirmary at ten minutes past eight o'clock P.M. of October 18, 1851. The physician's clerk who admitted her was merely informed, that she was suffering from the effects of poison, which she had swallowed about seven P.M. of the same day. She was insensible, pale, cold, and incapable of being roused. The jaws were firmly clenched. The pulse small and irregular, but distinctly felt. Inspiration feeble; expiration sudden and prolonged. *A blue coloration of the lips* at first led to the supposition, that sulphate of copper had been the poison used. There had, however, been no vomiting, purging, or other manifest indication of arsenical poisoning. The breath had an alcoholic odour. The stomach-pump was immediately applied, and a large quantity of *bluish* clear fluid, mixed with shreds of mucus and fragments of half-digested bread, was withdrawn. The patient then revived considerably, the temperature of the body rose, and the pulse improved in strength.

About nine P.M. severe purging, cramps, and vomiting, together with pain in the fauces, were observed, and the case was then treated as one of arsenical poisoning. Freshly prepared hydrated peroxide of iron was administered in large quantity, and an enema, containing olive oil and tepid water, was injected. These remedies seemed to afford considerable relief. Sinapisms were afterwards applied to the abdomen and inner sides of the thighs, and were renewed at intervals throughout the night.

19*th*.—When seen at the hour of visit, the patient was retching violently; the cramps of the extremities were excessively severe,

and required the constant application of warmth for their alleviation; the arms and upper part of trunk cold; pulse exceedingly small and compressible; the eye was clear, and surrounded with a dark areola; the complexion was dingy, and the whole appearance recalled the phenomena of the collapse stage of Asiatic cholera. The resemblance was heightened by the coolness of the nose, lips, and breath, by the incessant thirst, by a slight laryngeal stridor, perceptible during breathing, and by huskiness of voice, observed when the patient spoke. The efforts to vomit were, for the most, ineffectual; the dejections were fluid, containing dark minute shreds. There was strangury, but no urine had been passed since admission, and on percussion the bladder seemed empty. The patient complained chiefly of pain in the throat and fauces (where, however, no unusual amount of redness could be seen), in the stomach and bowels, and about the bladder. There was *no distension or tenderness of the abdomen.*

A large emollient enema was again administered. She was directed to drink large quantities of water, and to have infus. lini, milk, and beef-tea *ad libitum.* A single grain of opium was given.

20*th.*—The patient's appearance indicated some improvement, and she was able to answer questions distinctly. Surface of body warmer, cramps less severe; less retching, and pulse firmer. In the evening, however, cramps, muscular twitchings, and vomiting, recurred with great severity. A large linseed-meal poultice was applied to the abdomen, and repeated draughts of milk and calcined magnesia, with small opiates, administered.

21*st.*—During the night she had vomited much green fluid. The expression of countenance indicated intense suffering, and the cramps, especially in the legs, were much complained of. The upper extremities were cold, moist, and clammy. The voice husky; pulse imperceptible; excessive strangury. In the afternoon she was seen by Professor Christison and Dr Robertson, and found to be drowsy, but still capable of answering questions. Eye clear, throat still painful, and breathing faintly stridulous. Abdomen neither tumid nor tender. Pulse quite imperceptible. No signs of pneumonia. No urine had been observed since her admission, and assuredly none had been excreted for at least two days. Carbonate of potass, and sp. ether. nit. were now, by Dr Christison's advice, given freely along with the diluents; but the urinary secretion was never restored, and the patient in a few hours sank into a half comatose condition, and died on the afternoon of the 22d October.

Sectio Cadavaris—24th October.—Body muscular, well formed, rigid. Well-marked ecchymosis about right eye, and on right side of nose.

Chest.—Right side of heart gorged with much dark, loosely-coagulated blood. A small dark clot in left ventricle, the parietes of this cavity being thickened, and its capacity diminished. Valves

sound; lungs remarkably free from adhesions, and crepitant throughout. Blood and frothy mucus (?) exude when they are cut into and squeezed. No other trace of inflammation.

Abdomen.—Liver, weighs 3 lb. 7 oz., and is slightly fatty; gall-bladder nearly empty; bile thin, and light-coloured; spleen weighing 4 oz.

A thick white crust on anterior half of tongue; redness, but no swelling in vicinity of glottis; mucous membrane of œsophagus red throughout. Close to the lesser curvature of the stomach, and about a handbreath from the cardiac, there were two sloughy excavated ulcers, covered with green matter. The larger one had an irregular margin, was as big as a shilling, and was situated on the anterior wall of the stomach; the lesser was more sharply defined, was as large as a silver fourpenny piece, was surrounded by some unusual redness, and was situated behind the lesser curvature. The posterior wall of the stomach was very rugose, and presented a few minute ecchymosed points. The viscus seemed otherwise in its normal condition, contained a little greenish fluid; but no trace of arsenic could be detected on its mucous membrane by the eye. The duodenum, jejunum, and upper part of ilium, contained some mucous shreds, and a considerable amount of minute, dark-coloured flakes, resembling coffee-grounds, adhered to the mucous membrane. No other morbid appearance was visible in the intestinal canal. No unusual vascularity. Peyer's glands distinct. A considerable amount of green semi-solid fæces in the lower part of ilium, and in the colon. Rectum, bladder, kidneys, uterus, and ovaries healthy. Brain healthy.

Arsenic was detected with great ease by Reinsch's process, in the matters withdrawn by the stomach-pump during the patient's life, and in small portions of the liver and stomach taken from the body at the dissection.

The circumstances connected with the suicide were as follows: —The unhappy woman had formed an illicit connection with a soldier, although her husband (an English labourer) was still alive. Having suffered some ill-usage from her paramour, she proceeded on the morning of October 18th to the shop of a veterinary apothecary, and was there supplied by a boy of 15 or 16 years of age with a pennyworth of white arsenic, *mixed, in conformity with the act regulating the sale of arsenic*, with indigo. When asked her motive for making the purchase, she said she wished to poison rats; and the boy, who watched her manner and expression, did not observe any appearance of intoxication or incoherence. The patient confessed that she drank one glass of whisky immediately before making the purchase. At seven P.M. she swallowed the poison, and in a few minutes was found lying in agony on the floor of her room, exclaiming that she had poisoned herself. Vomiting had not occurred before the pump was used. She had taken very little food during the day.

To the above narrative of Dr Robertson, I add only a single remark in reference to the resemblance observed in both the cases to malignant cholera; and I am the more led to this, that, in a recent trial, where, I presume, some of the previous witnesses had described an indubitable case of arsenical poisoning as resembling cholera, the question was put to me, whether such a general resemblance was true or not, and I did not hesitate to say, that arsenical poisoning and cholera might resemble each other very closely. The two cases narrated above confirm this; and I must say that, had cholera been prevailing at the time in Edinburgh, and had the administration of poison been criminal, and, therefore, concealed, I might, but for one circumstance, have readily enough at my first visit pronounced the case of the girl Davidson one of cholera. The circumstance I allude to, was the appearance of the vomitings, which were suspiciously-thick tenacious mucus, with some appearance of a white matter mixed with them. There was, however, none of the sanguinolent colour which is sometimes observed in cases of arsenical poisoning; but the ejecta were abundantly distinct in appearance from the rice-water vomitings of cholera. That cholera and arsenical poisoning resemble each other closely, is corroborated by what occurred here at the outbreak of cholera in 1848. Among the first cases which occurred in Edinburgh were three children of the name of Kinnear, in the West-Port, who were attacked simultaneously with vomiting, purging, &c., and they were actually made the subjects of investigation by the authorities, and submitted to me for analysis. The further progress of the epidemic, and the negative result of the analysis, showed what the cases really were.

It was my intention to have appended to Dr Robertson's case some observations on the means of colouring arsenic, as enjoined by the sale of arsenic act; but as these would involve some points in a case which is soon to be the subject of judicial proceedings, I reserve them for a future opportunity.

66, Frederick Street, Edinburgh,
January 21, 1852.

ARTICLE V.—*Contributions to Obstetric Pathology and Practice.* By J. Y. SIMPSON, M.D., Professor of Midwifery in the University of Edinburgh.—(*Continued from p.* 45.)

NO. III.—TURNING AS A SUBSTITUTE FOR CRANIOTOMY IN LABOUR DELAYED BY OBSTRUCTION AT THE BRIM OF THE PELVIS.

FORMERLY, medical practitioners seem to have thought little, and medical writers said little, regarding the very repulsive and revolting character of the operation of craniotomy, when performed, as it frequently was, when the child was still living. Apparently some obstetric practitioners and writers of the present day continue to look upon the practice of craniotomy as one that should not unfrequently be adopted, and one which it is quite justifiable to adopt.

Obstetric reports, and collections of cases, have been published within the last few years, describing craniotomy as performed forty or fifty times, or oftener, by the hand of the same practitioner. But perhaps, ere long, it will become a question in professional ethics,—Whether a professional man is, under the name of a so-called operation, justified in deliberately destroying the life of a living human being? For one, I have a strong conviction, that in the kind of case in which the operation is most frequently performed, namely, where there is obstruction from some disproportion, not very great in degree,[1] between the maternal pelvic brim and the fœtal head, the operation is not one which is either morally or professionally justifiable, if the child be still living. Not many years ago, the medical practitioner had this one plea to urge in favour of the adoption of the operation,—that *perhaps* the child was already dead; inasmuch as there then existed no certain means of knowing that it was still alive. Auscultation, however, now furnishes us with certain means of settling this question in practice, and has consequently removed this argument in favour of the adoption of the operation. Or perhaps the result would be more correctly given by stating, that in cases of lingering and difficult labour, from some disproportion between the size of the fœtal head and maternal pelvic brim, auscultation can now determine the instances in which the child is dead, and in which, therefore, it is justifiable and right to have recourse to delivery by craniotomy; while it shows us also, on the other hand, the strong impropriety and illegitimacy of adopting the same operation in other analogous instances, where the sounds of the fœtal heart indubitably prove, to the ear of the medical attendant, that the infant continues alive and well.

Assuredly no man would consider himself justified, on any plea whatever, in perforating, and breaking down with a pointed iron instrument, the skull of a living child an hour after birth, and subsequently scooping out its brain. But is the crime less, when perpetrated an hour before birth? Modern physiology has fully shown, that there is no such distinction between the mental and physiological life of an infant, an hour before labour is terminated, and an hour after it, as to make any adequate distinction between the enormity of the act, as perpetrated at the one or at the other of

[1] During Dr Collins' charge of the Dublin Lying-in Hospital, craniotomy was used in 124 cases; in 79 instances on account of tediousness or difficulty in the labour. In one only of these cases was the conjugate diameter of the pelvis as small as 2½ inches. "This," he says, "was *by much* the most defective pelvis I ever met with in the hospital." "The only means," he observes, "of effecting delivery where the disproportion between the head of the child and the pelvis is so great as *to prevent reaching the ear with the finger*, is by reducing the size of the head, and using the crotchet"

In most cases requiring craniotomy, the contraction at the brim is in the conjugate diameter, from the projection forwards of the promontory of the sacrum, —the very kind of deformity, in which turning is most likely to be the means of saving the life of the infant.

these two periods. And, as if to add to the horrors of craniotomy, when done upon a living infant, some authors (and among them even the very latest), tell us, that whatever doubts may have existed as to the child being alive or not at the date of operating, the results of the operation itself will decide this point; for if it be alive at the time of the deadly perforation of its scalp, skull, and brain, this fearful fact will be revealed to the practitioner by warm and fluid streams of blood pouring along his fingers and hand, before any masses of broken brain escape; or the reverse.

Unfortunately, no operation in morbid labours is more easy than craniotomy. "Of all instrumental operations in obstetric surgery," says Dr Ramsbotham, "the perforation of the skull, and extraction of the mutilated fœtus, is the easiest which could be undertaken, for delivery in any case of impacted head; and much do I fear that to the facility with which this operation can be accomplished, have been sacrificed the lives of many children."[1] The operations which midwifery possesses as substitutes for craniotomy are, however, not very difficult in performance. And no conscientious practitioner would surely hold the mere difficulty of an operation, as the criterion by which he should decide upon the act of child-murder or not.

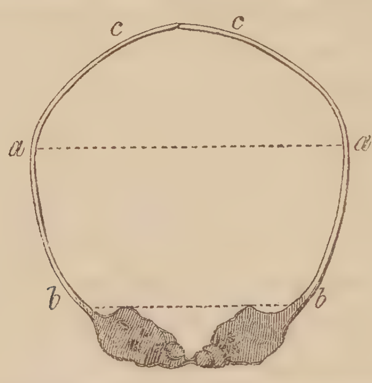
In women who, in previous labours, have had the children removed from them by the operation of craniotomy, nature has herself occasionally pointed out to us, in other labours in the same patients, various means and resources by which that operation could be avoided. Midwifery, as an art, has appropriated some of these hints, and happily applied them in practice. Ever and anon, women, who had been previously the subjects of difficult and dangerous labours, have, when parturition came on *accidentally*, at the seventh or eighth month, borne living children easily and safely. Accoucheurs have, in similar cases, taken advantage of this suggestion, and have had recourse to the *artificial* induction of premature labour. In other instances, in which previous labours had been found difficult or impossible without craniotomy, in consequence of the form of the maternal pelvis, a successful termination has occasionally occurred, when the child happened, in subsequent labours, to present with the feet or pelvic extremity, instead of the head. In such instances, the presentation of the feet or pelvis, or of a hand (requiring the presentation to be *ultimately* made footling), has sometimes, when first discovered at the commencement of labour, been regarded as a source of undoubtedly increased danger and difficulty; when it has at last, in reality proved a source of increased safety to the mother, and led, indirectly, to the preservation of the life of the infant.

The records of cases of difficult labour left us by Mauriceau, Smellie, Hull, &c., show that in particular forms of difficult labour

[1] Obstetric Medicine and Surgery, p. 290.

and deformed pelvis, the passage of the child by the feet or pelvic extremity affords some special facility of transit, which is wanting when the head or cephalic extremity forms the presenting part.

I believe that this apparent paradox is explicable by a reference to the anatomical structure or form of the fœtal head itself. At birth, the whole body of the child has, in its configuration, been justly compared to that of a cone,—the arch, or biparietal diameter of the skull, forming the base of the cone,—the feet forming its apex; and there being a gradual tapering and diminution of size from the former to the latter points. But the fœtal head itself, when taken alone, presents also, though more imperfectly, the configuration of a cone:—the base of the skull being considerably narrower than the arch,—or, in other words, when (as represented in the accompanying woodcut) we make a vertical transverse section of the fœtal skull, we find its bimastoid diameter, *b b*, is considerably less than its biparietal diameter, *a a*,—the cranium increasing



gradually in breadth and size from below upwards. The difference between these two diameters in the child at birth generally amounts to from half-an-inch to three-quarters.

Further, it must be held in view, that at its base, or bimastoid diameter, the fœtal cranium is so strong, and its bones so strongly united, as to render it quite incompressible. On the other hand, in its arch, or biparietal diameter, the cranium at birth is generally so thin and elastic in its bony parietes, and its sutures are so imperfectly united, as to admit of the head being in its upper parts laterally compressed, or even depressed and indented, at some point, without necessarily destroying the life of the child.

In consequence of the above conformation, it happens, that when the child, in a somewhat contracted pelvis, passes as a footling presentation, the cone-shaped head of the child first enters the contracted brim by its *narrower* or bimastoid diameter; and the hold which we have of the protruded body of the child, after its extremities and trunk are born, gives us, when necessary, the power of employing so much extractive force and traction at the engaged fœtal head, as to compress the elastic sides of the *broader*, or biparietal portion of the cone, between the opposite sides or parts of the contracted pelvic brim, to such a degree as to allow of the transit of the entire volume of the head. In natural

labour, the mechanism consists in passing a conical-shaped body (viz., the child) through an aperture (the maternal pelvis) somewhat *larger* than the base of the cone itself (the arch of the fœtal skull); and in this case, when once the base of the cone or head does pass, a single pain is generally sufficient to expel the remainder of the infant,—an arrangement by which dangerous compression of the cord is avoided by nature. But when the brim of the pelvis is somewhat less than the natural standard, or the head somewhat above that standard, either from size or malpresentation, the conditions are so far altered, that we have now a conical-shaped body (the child) to be passed through an aperture (the brim of the maternal pelvis) somewhat *smaller* than the body that is to pass. And a little reflection is sufficient to show, that under such circumstances, the passing body would be more easily dragged through the contracted aperture, by bringing the narrow apex of the cone first, than it could be pushed through that aperture by allowing the base, or broad end of the cone, to be presented to it; more particularly, if that broad end is, as we have supposed, somewhat larger than the aperture which it is to pass through.

Since writing upon this subject at considerable length a few years back (see *Provincial Medical and Surgical Journal* for 1847-48), I have repeatedly had occasion to turn the child in difficult cases, where the head was not far entered into the brim, and where the long forceps failed, or were contra-indicated; and in which the alternative of craniotomy seemed the only other measure that could be adopted. A number of my professional brethren have reported to me the success with which they have also followed this practice. In the way of illustration, I adduce the three following cases which have occurred in my own practice and in that of my friends, Dr Weir and Dr Peddie, within the last few weeks. I have the pleasure of detailing the cases recently met with by Dr Weir and Dr Peddie in their own words.

Case I.—On the evening of January 11th, I was asked to see a case of lingering labour, under the charge of Mr Keeling and Dr Cooper. The patient, æt. 26, and pregnant for the first time, had been in labour for about forty-eight hours. The first stage of labour had been terminated about thirteen hours before I saw her; and the head had remained at the brim of the pelvis, without advancing in any degree further down, for upwards of ten hours. On examining, I found the vagina fully relaxed, but its mucous membrane was becoming heated and œdematous, in consequence, in all probability, of the lengthened obstruction at the brim above. The infant's head was elongated down into the cavity of the pelvis; but the broad part of the head had not passed the brim. The promontory of the sacrum was so easily reached by the finger, as at once to give the idea, that it projected forwards to an extent greater than natural. The direction of the sagittal suture, showed

that the head lay more transversely than in the usual normal presentation. The face of the infant was directed to the right sacro-iliac synchondrosis, or rather to the right ilium. The patient was put fully under the influence of chloroform, and the long forceps were easily applied. The blades of the instrument were, as we found after the birth of the child, applied, as usual, obliquely over the head, and did not offer to slip in any degree under the traction that was applied. But no amount of traction that I thought it justifiable to employ could move the head downwards; and Mr Drummond failed also in making any impression upon the advancement of the cranium when I gave him the instrument to use. I altered, in several ways, the direction of the traction, and the position of the patient, but still without any success; and, at last, withdrew the forceps. Conceiving, that possibly there might be some obstruction to the advancement and passage of the child, from some mal-position of the arm about the neck, or from some mal-formation, I introduced the hand by the side of the child's head for the purpose of ascertaining these circumstances, but found nothing that appeared to me capable of explaining the delay, and the impossibility of advancing the head with the forceps, except it were some oblique position of the head, relatively to the neck or trunk of the infant. A few years ago, I would in such a case have, perhaps, deemed the operation of craniotomy the only remaining resource. But the stethoscope showed that the child was still alive and well. And, under these circumstances, I resolved to attempt to extract it by the operation of turning. The patient was deeply anæsthetised, in order to relax the uterus as much as possible; and, at a time when all uterine contraction seemed absent, I passed up my hand and brought down one of the lower extremities of the child. When doing so, a large loop of the umbilical cord fell down into the vagina. I now found an obstruction to the complete version of the infant, which I had met with previously in other cases of turning, when the head was the original presenting part. For, though one foot was down at the orifice of the vagina, the version of the fœtus upon its own axis, had not been complete, and the head was still at, or near, the brim. Consequently, while Mr Drummond held and retained the extruded foot, I passed up my right hand to the head to push it upwards, so as to complete the version,—a part of the operation, which, in this, as in other cases, is always much aided by the manipulation of the left hand upon the abdomen externally. Subsequently the trunk and arms were easily extracted, and the traction requisite to make the head pass the brim, was much less than I had seen in several similar cases. The child, after birth, had the heart still pulsating; and was readily revived by repeatedly plunging its body alternately from a warm into a cold bath. Yesterday (21st January) I saw both the infant (which was, perhaps, rather above the usual size) and the mother, quite well.

CASE II.—On the evening of the 2d December 1851, I was requested (Dr Weir writes me) by my pupil, Dr Bone, to give an opinion upon a case of protracted labour. The patient had been eighteen hours in labour of her fifth child. She had been, in previous labours, the subject of tedious and difficult labour, except in one confinement, when the child was born below the usual size. Her face was flushed, eyes suffused, skin hot, pulse quick, and restlessness great. The os uteri was completely dilated, and the liquor amnii discharged. The head was still at the brim of the pelvis, and although the pains had been for many hours quick, strong, and expulsive, a very small portion of it penetrated the pelvic cavity; and so much as did, receded above the brim upon the cessation of the uterine contractions. Under these circumstances, I determined to deliver her immediately, and as it appeared a favourable case for turning, decided upon doing so in preference to using the long forceps. The chloroform was administered till deep snoring was produced, and the hand introduced in the usual manner. So completely were the uterine efforts suspended, that I grasped both the feet before the uterus contracted in the slightest degree upon my hand. No difficulty was experienced in extracting the child till the head reached the brim, when considerable force was required to draw it through; but not so much as to prevent its being born alive. The mother did well, and in a few days was attending to her household duties. The child presented, after birth, a deep depression of the cranium, on the anterior part of the left parietal bone, immediately above the ear,—the result, no doubt, of compression against the promontory of the sacrum. But this has not affected the health of the child, which now (20th January) is otherwise thriving and well.

CASE III.—On the 30th November 1851, I was called (writes Dr Peddie), to Mrs ——, aged 30, in her sixth confinement.

At her first confinement, November 10, 1843, in consequence of contraction at the brim of the pelvis, principally on account of an exostosis projecting from the promontory of the sacrum, and to some extent also from an under average size of the pelvis, she was delivered by embryulsio. This extreme measure was not resorted to until forcible natural pains had existed for many hours, without effecting an entrance for the head at the brim of the pelvis; until the long forceps had been applied, first by myself, and then by Dr Simpson, without obtaining any advance of the head; and until the fœtal circulation had been ascertained to have ceased. After the perforation was employed, no small difficulty was experienced in dragging the child through the pelvis.

At her second confinement, 26th September 1844, after allowing four hours to elapse from the time when the os uteri was fully dilated without the smallest descent of the head, I succeeded, with the long forceps and powerful traction, in delivering the child

safely. This fortunate termination was the more satisfactory, that the induction of premature labour had been considered and decided against some months previously.

At her third confinement, 20th April 1846, the labour went on naturally, and the child was expelled without artificial assistance. The explanation of this fortunate event appeared to be, that the child was a female one, and considerably under the average size, the head, more particularly, being small.

At her fourth confinement, 28th October 1847, the labour resembled Mrs ——'s first, the first stage being short, while the second had existed for many hours before I saw her. The pains were extremely forcible, conveying the impression of danger from rupture of the uterus. After trying two different pairs of long forceps, I sent for Dr Simpson, who furnished me with a third pair—which, though easily applied, and powerful, did not enable me to bring forward the head in the least degree. Dr Simpson then proposed turning in preference to perforation—the more especially as the child was ascertained to be still alive; and this he accomplished readily, the patient being very deeply under chloroform—and delivered her after the employment of very powerful traction. The child was at first as if still born, but was brought about after the continued use of the usual means.

At her fifth confinement, 11th December 1848, the presentation was a footling one—as if nature was indicating the right mode of procedure; and, accordingly, when the first stage was completed, I seized hold of the other foot, brought it down, and delivered the child safely, but not without the employment of very considerable traction in bringing the head through the pelvis.

At her sixth and last confinement, 30th November 1851, I saw Mrs —— at 11 A.M. Pains had begun about 12 o'clock on the previous night, and had gone on regularly, but not severely, until within two hours from the time of my visit. I found the os completely dilated, the vagina filled with tensely distended membranes, and the head above the brim. On passing the hand to make a proper examination, I recognised the old exostosis, but decidedly larger, fully the size of a small walnut, projecting from the sacrum immediately within the right sacro-iliac symphisis. I found also, that the head was lying with the occiput to the sacrum, pointing somewhat to its left iliac symphisis, and the forehead to the right side of the symphisis pubis. I was also satisfied, that the head was of large size, while the pelvis generally was small.

Considering previous experience in the case of this patient, and the remarkable success of turning in her fourth labour, when she could not have been delivered otherwise than by the life-sacrificing perforator; and considering that in the present labour the peculiar position of the head would render efforts by the long forceps—however well employed—useless, I resolved at once to turn. This I accomplished, and brought down the body very satisfactorily,

while the patient was placed deeply under chloroform by Dr Harper of Leith, who kindly assisted me. As was to be expected, much exertion and pulling were necessary to drag the head through the pelvis, although the most favourable respective diameters were chosen. A towel slipt round the anterior part of the neck and chest, and crossed over the shoulders behind, gave steady purchase, and enabled me more readily to complete the delivery. The child was a large boy, and at first apparently still-born, but in about twenty minutes, after unceasing attention by giving alternate plunges in hot and cold baths, as practised in the first and second labours, and by the use of artificial respiration, he was completely restored. He ultimately did well, and Mrs —— made an excellent recovery. The child weighed 9 lbs. 5 ozs.

In conclusion, let me briefly recapitulate some of the principal advantages which, as it appears to me, the operation of turning has over the operation of craniotomy, in cases such as we have been considering in the present communication, viz.:—where the pelvis is somewhat too small, or the fœtal head somewhat too large, to allow the infant to pass by the unaided efforts of nature, or even with the assistance of the long forceps, if that instrument is had recourse to.

I. It substitutes the delivery of the infant by the hand of the accoucheur, for its delivery by formidable steel instruments. And certainly the avoidance of instruments is, as a general principle, desirable when it is possible.

II. The transit of the cone-shaped head of the child, through a somewhat narrow brim, is facilitated by the narrow end of the cone (or bi-mastoid diameter of the head) being made to enter and engage first in the contracted brim; and the hold which we obtain of the extruded body of the child, enables us to employ so much extractive force at the engaged fœtal head, as to make the elastic sides of the upper and broader portion of the cone (or biparietal diameter of the cranium) to become compressed, and if necessary indented, between the sides of the contracted brim.

III. When the child is brought down footling, we have far more power than when the spherical arch of the cranium presents, of manually adapting and adjusting, when necessary, the shape of the head to the shape of the contracted brim; the rounded form of the cranium not affording us any sufficient hold and purchase for this purpose in cranial presentations.

IV. The *lateral* and very *temporary* compression of the fœtal head, by the contracted sides of the pelvis, such as we can produce and effect on artificial turning and contraction, is less dangerous to the life of the child than its *oblique* or longitudinal compression with the long forceps, or by the *long* impaction of the head itself in the contracted brim.

V. In cases where the narrowness is greater, and such as to pro-

duce a depression or indentation in the elastic and flexible cranium of the child, still this transient depression, or indentation, is not necessarily destructive to life, as the perforation of the head in craniotomy is. Children often survive and recover, when born with the head much distorted and even indented. See, for example, the child in Case II.; and other similar instances recorded by Smellie, Denman, Velpeau, Duges, Jacquemier, Radford, &c. &c.

VI. On these accounts, the operation of turning affords a fair chance of life to the child; while craniotomy affords none. And even when the turning and extraction require some considerable time for their performance, the resulting temporary asphyxia of the child is not necessarily so deep and fatal, but that the infant may be revived by appropriate measures applied after birth. I can, for one, state that in these cases, and in instances of common footling and turning cases, I have repeatedly been astonished at the viability of the infant after traction had been applied to it, both so strong in degree and so long in duration as to leave apparently little hope of its survival; and I have heard other practitioners make the same remark as the result of their experience.

VII. The operation of turning, under the circumstances we speak of, will, I believe, be found also to be more safe to the life of the mother than the operation of craniotomy. In every instance the operation of craniotomy is necessarily fatal to the infant; but in a very large proportion also, this operation is fatal to the mother. The statistical results collected by Dr Churchill and others, show that craniotomy is fatal to the mother in about 1 in every 5 cases in which it is performed; while turning does not generally prove fatal in above 1 in every 15 or 16 patients, even including complicated cases.[1] Besides, it affords this great source of safety to the mother, that, *cæteris paribus*, delivery by turning can be, and is, as a general rule, adopted far earlier in the labour than delivery by

[1] Out of 303 craniotomy operations, 60 of the mothers died, or 1 in 5. (Churchill's Midwifery, p. 314.) Out of 192 cases of turning, 12 mothers died, or 1 in 16. (Ibid. p. 250.) "Between," says Dr Ramsbotham, "the years 1823 and 1834, I delivered more than 120 women under transverse presentations, independently of a few cases to which I was summoned, where spontaneous evolution occurred. Many of these cases presented a formidable appearance; for in one, the membranes had been ruptured a whole week; in another, 69 hours; in a third, 58 hours; in another, 55; in another, 53; and in many, more than 48: and, as a general principle, we presume, that the longer the liquor amnii has been evacuated, the more likely is the uterus to have embraced the fœtal body firmly, and the more difficulty will there be in overcoming the resistance. In none of these cases did I exhibit large doses of opium, and in those few where bleeding was practised, that operation was had recourse to, not for the purpose of relaxing the rigidity of the uterine fibres, but to relieve the inflammation which the soft structures were suffering, and to remove tumefaction. In not one of these instances was any injury inflicted on the uterine structure by the hand; nor did any permanent evil arise that could be attributed to the operation. In four cases only was the uterus so powerfully contracted as to refuse admittance to the hand, and compel me to adopt the alternative of eviscerating or decapitating the fœtus."—*Obstetric Medicine and Surgery*, p. 362.

craniotomy; and in proportion as it is practised earlier, so far also will it be practised with greater safety and greater success,—the maternal mortality attendant upon parturition, whether natural or operative, increasing always in a ratio progressive with the increased duration of the labour.

Among the operative deliveries which occurred in the Dublin Hospital, when Dr Collins was master of the Institution, the duration of the labours at the time of operating is stated in 125 cases. Among these 125 instrumental and operative deliveries, only 1 in every 17 of the mothers was lost, when the delivery was accomplished within twenty-four hours from the commencement of labour; 1 in every 7 of the mothers died when the delivery was delayed till from twenty-four to forty-eight hours; and nearly 1 in every 2 mothers perished when the delivery was delayed till the labour had gone on above forty-eight hours. Obstetricians have often argued, that if, in cases of obstructed labour, the delivery is delayed for a sufficient length of time, the child will be ultimately destroyed by the uterine action and compression, and that thus craniotomy will be at last performed upon the dead infant,—the child being killed by an act of omission and not of commission. But even such very protracted delay is not always fatal to the infant, some continuing to survive when the labour is prolonged for sixty, or seventy, or more hours.[1] And it is always to be remembered, that the delay itself, if dangerous to the life of the child, is also, as the above and other evidence shows, almost equally dangerous to the life of the mother. In such cases of long obstruction and delay, even after the head is perforated by craniotomy, much traction is often required to drag the shoulders through the contracted brim, and that at a time when the structures at the brim are so damaged by previous pressure, as to be little able to bear compression with safety. And I do think that we have most ample grounds for believing, that the *long* compression of the soft parts, such as occurs in very protracted labour, is more truly dangerous to the structures than a *short* compression of them, greater in amount, such as occurs in the operation of turning when early performed. (See, on this point, *Provincial Medical and Surgical Journal* for 1848, p. 534.)

In not a few cases, in which the operation of turning is resorted to in consequence of the complication which we have been considering, the practitioner must be prepared to meet with such resistance to the passage of the head through the brim as will require some adjustment and considerable physical exertion on his part, in order to overcome it. But if the head be so adjusted in the brim, that

[1] Out of 27 cases reported by Dr Collins, in which labour was prolonged to sixty hours and upwards, in 16 the child was born dead; and in 11 it was still alive at birth. Of the 27 mothers, 1 in 4 died.

the shape of the one is, as much as possible, adapted to the shape of the other; if the chin be kept depressed towards the sternum; and if the traction applied be made in the proper axis of the brim itself, no small amount of extractive force may be used without compromising the safety of the mother or infant. The degree of traction which the structures of the infant's neck will, in this way, undergo, is much greater than one would *a priori* suppose. And as a very general rule, the elastic lateral walls of the cranium of the child will become compressed or indented, before any dangerous injury is inflicted upon the structures of the neck. But on this subject I most willingly substitute for any remarks of my own, two or three sentences from the work of an author,—always practical and always cautious,—Dr Denman, who, in speaking of the occasional difficulty of extracting the head in common pelvic and turning cases when the brim is somewhat contracted, gives, among others, the following directions:—

"The force with which we endeavour to bring down the head of the child, must then be gradually increased, till we are convinced, that a greater degree is inconsistent with the safety of the child, or induces the hazard of separating the body from the head. Should the head descend in ever so small a degree, we must not act precipitately, and increase the force in order to finish the delivery suddenly; but we must proceed with circumspection, or we shall add to the danger which the child is already in, and run the risk of doing injury to the mother; though, when the head begins to advance, there is seldom much remaining difficulty, the cause usually existing at one particular part of the pelvis. It has been said, that children have sometimes been born alive, when the strongest efforts, and these continued for many hours, have been made to extract the head detained in this position. But I have not been so fortunate as to meet with any such instances, a short space of time having generally been sufficient to frustrate my hopes, and convince me that the child was dead. Though when the head has been detained a considerable time, a few cases have terminated more favourably than I could have expected, and I have been agreeably surprised with the discovery of some faint signs of life, which by the assiduous and careful use of the common means, have been improved, and the life of the child at length perfectly recovered. * * * When we have in vain exerted all the force which we think reasonable and proper, and which, in some cases, must be more than any circumstance would be thought to require, it will be expedient to rest, for the purpose of gaining all the advantage to be gained by the compression of the head. On this account, the mother will actually suffer no more inconvenience, than would have been purchased if the head had originally presented, and been locked in the pelvis. After waiting some time, we must renew our attempts to extract, and thus proceed, alternately resting and acting with efficacy and resolution, and if the hold we may have of the body or

extremities of the child does not suit, a silk handkerchief or other band may be passed round its neck, and this will be found a very handy and convenient instrument. It must (Dr Denman adds) be a very great disproportion between the head of the child and the pelvis, which is able to withstand this method of proceeding, if we persevere in it with prudence and steadiness; because the integuments of the head will burst, or the bones be bent inwards in an extraordinary degree, or even broken. * * * (If it fail) it then only remains that we should lessen the head of the child; and the operation may be as easily performed in this, as in the natural presentation of the head. When (he continues) the perforation is made, and the brain evacuated, the head may be readily extracted either by pulling by the body of the child, or by inserting a crotchet in the opening made by the operator as in other cases. But it will be scarcely believed how seldom this operation is necessary under these circumstances, if we have not been in a hurry, but have acted with prudence. Nor (concludes Dr Denman) have I ever known any ill consequences follow the compression which the soft parts undergo, between the head of the child, and the sides of the pelvis, if proper attention were afterwards paid to the state of the bladder and rectum."[1]

ARTICLE VI.—*Case of Encysted Tumour of the Right Eye-brow, occasioning severe Paroxysmal Pains in the course of the Supra-orbital Nerve; Removal of the Tumour by operation, with cure of the Neuralgia; Cyst contained an Earthy Concretion.* By H. B. NORMAN, Esq., F.R.C.S., Surgeon to the North London Infirmary for Diseases of the Eye, and to the St. Marylebone General Dispensary.

(*Communicated through Professor Syme, as an observation similar to that recorded by Dr Allan in our last Number.*)

ELIZA BROWN, æt. 20, a tall, fine young woman, occupying the situation of nurse in a gentleman's family near me, was sent to me (March 15, 1849) by her master for advice respecting a little swelling, which had existed for about two years on the right side of her forehead, partly covered by and partly above the eye-brow, between the middle and inner end of which it was situated. It was plainly perceptible, but not so much on account of its size and prominence (for it was not larger than a tick bean), as on account of its separating to some extent the hairs of the eye-brow, and the skin covering it being red, tense, and shiny (inflamed). The tumour, a little larger at its base than its surface, could be readily raised from the subjacent parts between the fingers, and was quite loose on that aspect, but the skin seemed to adhere closely to its upper surface, and could not be pinched up. It was very hard, but not very tender when squeezed. It occasioned but little disfigurement to the face,

[1] Introduction to the Practice of Midwifery. P. 495, &c.

and no anxiety on that head; but it was believed to be the cause of a great deal of severe paroxysmal suffering, to which its owner had been for some time past subject, in the course of the supra-orbital nerve of that same side, and which had recently been felt at times in the course of the nerve of the opposite side, so as to occasion fears that similar disease might occur there. The case seemed to me to be one of encysted tumour of simple character, which, from its situation only, had proved so troublesome, and the removal of which would probably prove to be also the cure of the girl's sufferings. An operation was proposed and gladly acceded to. She was of a *very plethoric* habit, and had a dry furred tongue. I advised her, therefore, to abstain from animal food for two days, and prescribed for her five grains of blue pill, to be taken at bed-time, and to be followed by a draught of senna and salts next morning.

17*th*.—Having attended to my directions, and her tongue being clean and moist after a free purgation by the medicine, I dissected out the tumour with great ease, although it proved to be somewhat adherent,—having first shaved off the eye-brow, and made the incision in its line, in order that the hair, on growing again, might cover the cicatrix. The little bleeding that followed was soon stopped, and the wound, united at the time by one point of suture, healed without a particle of pus being formed, except around the thread of the suture, which was taken out at the end of two days.

On examining the tumour, it was found to consist of a thin cyst, not very well defined, except on the cutaneous surface, and containing a small, hard, brittle, earthy concretion, rather rough on its surface, and about as large as a pepper corn. Its chemical constitution was not ascertained. After the removal of the tumour, there was an end of the pain that had been so much complained of before in the course of the supra-orbital nerve, confirming thus the belief entertained before the operation, that the pain was caused by the pressure of the tumour, and therefore the propriety of the operation for its removal.

In addition to the question suggested by Dr Allan,[1] whether or not other instances of tic douloureux may not depend upon causes similar to that existing in his case, and now described in mine, but so seated as to be beyond our power to detect or remove, there is another which requires to be determined,—namely, whether the calcareous concretions found in these cysts are primary formations, or whether the tumours were originally of fatty matter, epithelium scales, hair, &c., as frequently found, but having undergone a change and degeneration into the earthy substance, as obtains sometimes with fibrous tumours. I have no doubt that Dr Allan's question should be answered affirmatively; on my own, I should be glad to obtain information.

LONDON, January 19th, 1852.

[1] See the Edinburgh Monthly Journal for January, Art. V.

P.S.—This young woman, whose case I have related, presented me with one of the few examples I have met with, of the ill effects sometimes occasioned by chloroform. She took it at her own earnest desire, though I hardly thought it necessary. It occasioned her a *most severe* headach, attended with dry tongue, heat of skin, thirst, and quickened pulse, which continued more than forty-eight hours. I have no doubt that the drug used was bad, as similar mischief, together with violent sickness of equal duration, followed its use on two other patients about the same time;—to one of whom it was given for an operation upon an encysted tumour of the thyroid body; and to the other, for extraction of an injured finger nail. Such consequences have never followed in any other case of mine, though I have used it very frequently from its first introduction.

Part Second.

REVIEWS.

Doctrine de l'Ecole de Rio Janeiro et Pathogénésie Brésilienne, contenant une Exposition méthodique de l'Homœopathie, &c. &c. Paris et Rio Janeiro. 1850. Pp. 367. 8vo.

A Sermon Preached in the Church of St Augustine, Old Change, Cheapside, on Wednesday, April 9, 1851, *in Aid of the Hahnemann Hospital.* By the Rev. Thomas R. Everest, Rector of Wickwar. London. 1851. Pp. 76. 8vo.

When the followers of sober-minded medicine are taunted by the votaries of Hahnemann with the number, rank, and intelligence of the non-professional believers in his mysticisms, it is a common reply, that homœopathy is much akin in that respect to Mormonism, Southcotism, Agapemonism, or any of the other more plausible, but equally grievous impostures, which have been of late successfully palmed on human credulity as religion. It would appear that the comparison may soon become closer than has been hitherto thought. The homœopathic craze is about to pass into a crusade; and homœopathy is to rally round a standard of holiness. Matters have gone thus far, it is true, only in a land where the air is hotter, and the blood more inflammable, than in these regions. But there is no clime so cold, that it may not give birth or welcome to the wildest frenzy in a religious mask. And it is well therefore for those, who, with the best intentions in the world, lean to the toleration of homœopathy, that they shall be aware what extravagancies it may lead to, when let loose from restraint.

A personage of the name of Dr B. Mure, being taken with a passion to establish a great homœopathic centre for this earth, made the attempt first in Sicily, and then in Malta. Discovering, however, that these are both islands, he looked about him for a wider field, and fixed on Rio Janeiro as the radiating point for one goodly continent. His efforts were at first to no great purpose. But by and by his adversaries unluckily had recourse to corporal restraint for an argument; and an unsuccessful trial of himself and two homœopathic converts for alleged poisoning, and the imprisonment of two others in a cell where their constancy failed not under the torture of filth, vermin, and damp feet, raised Mure and his disciples to the dignity of martyrs, and spread their creed far and wide throughout the Brazilian capital. The result was the erection of a "School of Pure Homœopathy," which was sanctioned by the municipality as well as the government, and at last was empowered, through the patronage of the secretary of state, to license homœopathic physicians. This consummation seems to have been mainly brought about by the death of Prince Alphonso, heir-apparent of the empire, who died in the hands of legitimate medicine, and in some unintelligible way, in consequence of his having been supplied with a wet nurse labouring at the time—at least so say the homœopaths—under a consumptive complaint. There is evidently a mystery, and probably no little falsehood, in this tale. But at any rate, we are told that the homœopaths remonstrated against the error. And we can well understand, that, if they did, and there was an error, both the error and remonstrance were turned to excellent account in the controversy. It is not directly alleged that the Emperor Don Pedro became in consequence a homœopathic disciple; but at all events his government has granted the sect a status and privileges.

In the course of these proceedings, it occurred to Dr Mure, the president, and Dr Martins, the secretary of the School, both of them *têtes exaltées*, that there had been something mysterious, more than human, miraculous, in short providential, in the current of events. And through one stage after another, they at length arrived at the startling conclusion, that the world is undergoing a great regeneration; that Hahnemann was an inspired discoverer; that the blessing, designed through him for the human race, would have been rejected by man without an expiatory sacrifice; that the poor little Brazilian prince was the predestined victim; and that his death, occasioned by the blind incredulity and fatal prejudices of reasonable medicine, is to herald the downfall of Old Physic, and work out the physical redemption of the universe. These propositions have been enunciated with comparisons, blasphemous to our uninitiated sense, and which will readily suggest themselves to the reader without our aid.

These may appear strong asseverations. But the proof is unequivocal.

With the *Exposition méthodique* itself we have no concern. It presents nothing remarkably different from older specimens of homœopathic humbug, except that the symptoms of diseases and their remedies are represented in tabulated symbols, which, like the symbolical notation of chemistry, have a marvellous resemblance to mathematics. But it is in the *Prolegomena* that the little history given above may be collected, being there scattered piece-meal throughout a variety of heterogeneous documents. This introductory matter consists of a complimentary dedication of the book by the president to the secretary of the Rio Janeiro School,—a history of the School and its first graduation in 1847,—a narrative of the conversion of Broussais to Hahnemannism when in his dotage,—a new astronomical theory by the homœopathic professor of physics to the School,—a discourse before the Historical and Geographical Institute of Brazil, to celebrate the memory of the deceased Prince Alphonso,—and an Ode in French doggrel on the same fruitful subject.

In the introduction to the history of the School, the president thus approaches his object :—

"Homœopathy," says he, "is not a science merely, but also, for those who comprehend it, a sublime devotion, a form of religion, a rainbow of divine union, holding out to mankind the promise of speedy [physical] regeneration. Man has been slow to receive it. Persecution has hung upon its steps. But it has outlived persecution. And no wonder. For the hand of God is continually engaged in preserving from destruction the precious gift offered to a race unworthy of comprehending it."

These attributes, however, belong only to *homœopathie pure ;* which rejects for ever any alliance with the older fashion of medicine.

"It is infinitely easier to open up new roads than to try to unite the old art of physic with the new. Monstrous conjunction! Sacrilegious enterprise! Withered be the hand which shall attempt to realise it!"

Most heartily do we join in this vigorous exoptation. It is succeeded by a "History of the Rio Janeiro School of Pure Homœopathy." We are told that, after many disappointments, the secretary of state issued a warrant in 1846 for the School to grant certificates of homœopathic study to its pupils. And next year the first graduation was held with most uncommon solemnity.

"On the 2d of July 1847, at five in the afternoon, in No. 59, St Joseph Street, Rio Janeiro, fifty-four members of the Homœopathic Institute met in an apartment brilliantly illuminated, and hung with poppy-coloured damask, bordered with lace fringe, and gold and silver ornaments, and relieved with festoons of natural and artificial flowers. Above the seat of honour hung a portrait of His Imperial Majesty Don Pedro II., having at his right hand a portrait of Hahnemann, &c.

"At this moment Dr Mure, Dr Martins, Dr Figueiredo, &c., took each from the bureau, and hung round their necks, a white ribbon with two love knots,—the colour, as a symbol of purity of intention,—the form, to denote the circle of human knowledge,—and the knots to signify the union of men on earth with one another and with God in heaven."

Soon afterwards, the candidates took a long oath, consisting of nine articles, and binding themselves on the Trinity to believe in all the absurdities of Hahnemann's theory and practice, and in nothing but pure homœopathy. In No. 7 of the articles, they swear by "The Father, the Son, and the Holy Ghost"—

"'That it is a sacred duty for every christian to submit to experiments on himself, so far as health allows, remembering that our Divine Saviour submitted to an ignominious death on the cross, to purchase for us forgiveness of sin and eternal happiness.'

"This oath being administered, the candidates all stood up, and Dr Mure said to them:—In name of Hahnemann, discoverer of homœopathy, from whom I have received commission and power, and with the aid of my colleagues, disciples of this messenger of heaven [envoyé du ciel], I declare you fit to exercise the new art, and recognise you as my colleagues, and as professors of pure homœopathy.

"Thereupon the secretary thanked God, that a School of Homœopathy had been established after ten years of fruitless effort; and he continued to ejaculate Thank God! Thank God! until his emotions choked his utterance."

But the climax of all is the speech of this addle-brained secretary, delivered before the Historical and Geographical Institute of Brazil, in commemoration of the death of the infant Prince Alphonso. After much irrelevant and flowery rambling, he breaks forth into the following rhapsody:—

"Science had a tendency to become Christian. But this moral revolution was incomplete, so long as medicine, that great necessity of man obnoxious to pain, remained given up to Hippocratic and Græco-Roman tradition,—so long as historical conception continued, in a word, Pagan and material. It was then that appeared *Hahnemann*, the most astonishing, the most inspired of discoverers. Through him Christian science became universal; and redemption descended from the dominion of sentiment to that of the ideas and of intelligence.

"But here, again, a mere logical conception can effect nothing with man. There must be a victim, an unexpected sacrifice, to overcome the indifference of the vulgar, that vulgar who demanded that the Saviour should be crucified and Barabbas set free. God willed that this expiatory victim should be born on the steps of the throne. God willed that a whole nation, that an entire world, should have its eyes turned on him, so that the news of this unlooked-for death might inform all, that humanity was about to make a mighty step in advance.

"Brazil, chosen by God for the first theatre of the physical redemption of mankind,—Brazil, whose social and political future depends on homœopathy, still languished in the bonds of ancient science, and respected the worn-out dogmas of the official doctrine. The reformers, after numberless conflicts, felt their courage fading, envenomed calumny dogged their footsteps, persecution thinned their ranks; when God arose, and by an unforeseen stroke, testified once more his sovereign will to save men without their aid, and in spite of them.

"A peal of thunder betokened the birth of him elected by God for this great mission; and three days of fairest sunshine heralded his return to his heavenly abode. Nature, who mourns for the woes of humanity, saluted with all her splendour a death apparently so deplorable; and, nevertheless, as salutary here below, as it is precious in the eyes of God.

"What more shall I say? Shall I describe to you how the poison, which was to destroy this tender flower, was instilled into him with the milk of a consumptive, who presented the most evident signs of the malady? How this fated subject of so cruel an experiment came to confer on homœopathy the certainty which it required? How the blindness of his physicians hindered them from taking any precautions, or accepting the preservatives we offered them?

"It would appear that man can return to good only through an excess of evil. In order that the human race should renounce the worship of false Gods, nothing less would serve than a *Deicide*. By a *Regicide*, allopathy was herself to indicate her last hour, and show to all Brazil the monstrous consequences of her mischievous endeavours.

"Nothing could prevail against the efforts of The Most High. The Prince Alphonso was destined to perish, and we to bear witness to his death, in order that it might prove more useful to the world than has been the life of the greatest monarch.

"The Prince Alphonso has fulfilled in our eyes a most providential mission."

The plain sense, or rather the plain nonsense, of this rhapsody is, that the One great atoning sacrifice is not all-sufficient for redeeming man: that a Physical Redemption was necessary, as well as a Spiritual: that Hahnemann has been sent from heaven to effect the former; but that he could not have succeeded in accomplishing it without an expiatory sacrifice, and that the sacrifice consists in the slow poisoning of a Brazilian baby with the milk of a consumptive wet-nurse.

This is either blasphemous, or too ridiculous to be blasphemous. Some may think it even too ridiculous to deserve notice here; but such is the shape in which it is alleged that homœopathy has overrun the capital of Brazil, to have become there a dominant medical creed, and to have reduced the mortality of the city in four years from 7294 to 4455 annually! And such, too, is the homœopathy which seems to have prompted the "Sermon of the Rector of Wickwar, in aid of the Hahnemann Hospital in London."

This divine, the Reverend Thomas R. Everest, informs us that he is a homœopath of eighteen years' standing, who imbibed pure doctrine at the feet of Gamaliel, having long been a personal friend of Hahnemann himself. Presuming upon this advantage, he not only professes profound contempt for ordinary medicine, but likewise looks down with no great respect even upon physicians of the homœopathic creed; and he lets it be pretty distinctly surmised that, in his opinion, the priest, as in days of yore, is the most competent practitioner of the healing art. While exercising his faculties in this double capacity, it occurred to him that homœopathy has a higher destiny than the mere cure of diseases; that its true end is the rooting out of the cause of disease; that the purpose of Providence in making it known is the removal of the Primæval Physical Curse, the source of all diseases, which was inflicted upon man at his Fall; and that, without this preliminary step, the cleansing of man's soul from sin is an arduous and uncertain task, but, with it, a very ordinary and facile achievement. Such appears to us to be the meaning of a vast quantity of mysticism, rhapsody, and rigmarole, in which the author has curiously dressed his propositions.

After having perfected these astounding discoveries, "it struck the author many years ago, that if such could be really the effect of a proper understanding of the words *cure of disorder*, * * * it was not likely the sacred page of the Word of God would be quite silent on the subject." Of course not.

> "In religion,
> What damned error but some sober brow
> Will bless it, and approve it with a text?"

Accordingly, the Rector finds a text to his mind in the very simple divine injunction to the disciples, to "heal the sick and *cleanse the lepers*." The nature of the ancient Jewish leprosy has always been a controverted and doubtful point in the history of medicine. Most people consider that the ancient disease is extinct. But these, it seems, are mere dreams of stupid Old Physic. Leprosy is—quite obviously to the homœopathic eye—no disease at all, but the great primæval physical taint of man's constitution. It only remained to ascertain what that taint essentially is. And it has been left for an English Rector of the year 1851 to discover—so entirely to his satisfaction that he has announced it from the pulpit to a Christian congregation of rank and intelligence—that the taint is neither more nor less than the *Diathesis Psorica*, or Tendency to Itch, which, in the fulness of his years, Hahnemann invented as the constitutional foundation of all chronic and most acute diseases. Where and how this discovery was made, is known only to the Rector of Wickwar. But what does that matter to the truth or merit of the discovery? The only question of moment is how to apply it; and that, too, is obvious: Remove the "Psoric tendency," by proper homœopathic treatment in childhood, and then disease will be extirpated, and all subsequent training—intellectual, moral, and religious—becomes altogether a simple concern.

This is very monstrous. But let the divine speak for himself:—

> "We contend that the action of these medicines on the human organism, having been first thoroughly explored, should be directed to * * * expel the psoric miasm *before* it develops itself in actual malady, not afterwards, because then it is too late to do what ought to be done.
>
> "So soon, therefore, as the infant opens its eyes on the light (if not before), so soon does the medicine of love begin its efforts to bring about harmony in the internal mechanism. * * * It loses not one moment in striving * * * to cleanse the constitution of the perilous stuff that has been mixed up in the very well-spring of life, before that it had acquired permanent power over the system. * * * Applying, then, the one harmonic agent which is adapted to the existing state, in such doses as the innervation requires, it quells disorder where it exists, without exciting any anywhere else, and so introduces harmony and order in the unconscious infant, at first with and by means of the mother's milk, and afterwards by such doses as the babe can bear.
>
> "And even in the very dawning blush of life thus placed in harmony, * * * the babe increases in wisdom as it increases in stature, and grows up in peace, calm, and comfort, in a fit state to receive the first dew of grace. The medicine

of love has preparéd the soul for the gospel of love. The seed of the Word will soon strike root in such a soil, and bring forth much fruit. * * * The first care of parents is, by proper dynamic medicines, to eradicate all those psoric tendencies which cause or increase all our aches, pains, ill tempers, obstinacies, rebellions, cachexies, and all chronic diseases. The molecular attraction proceeds normally. The infant develops into a normal child of the normal type, in whom all tendencies to irregularity, whether of body or mind, growth or disposition, are much weakened and simplified. * * * Continuing the physical education, * * * you commence the moral and religious training of the child. Plain, simple, easy, and charming, is THE GOOD NEWS OF GREAT JOY; and when its pleasant parables are read to a young child which has been thus first of all healed as God bade us do, whose nature has been thus prepared for them, *that* nature drinks them in as the thirsty sand does rain. * * *

" * * * And when you have brought about *this* sort of education,—that is to say, when you have fulfilled your Redeemer's instructions, and first healed the sick and cleansed the lepers, and *then* preached the Gospel to them, the great *Social Problem* which has puzzled so many generations, and this one most of all, is solved. You will find the attraction to evil of such a one reduced to a minimum. * * * His whole career will be one pleasant hymn of praise to that gracious Maker who has sent medicines to cleanse his leprosy and heal his sickness, and the Gospel to pour sunshine over his life, and save his soul. * * * It is your beating and scolding, your alcohol and mercury, your bad systems, bad medicines, bad teaching, and bad training, that make of the uncleansed leper and unhealed man, your no-Christian or your Christian so very unlike Christ; that plunge mankind into every eccentricity, and every extravagance, and every excess. And in harmonic medicine there is a cure for all these excesses; and in it the Gospel finds its fitting handmaid. And then truly the words of Jesus find their solution; and he who so preaches the Gospel will find no devils, or devilish lusts, or devilish passions, resist him; no dead so dead in trespasses and sins that he cannot imitate his Master, and say, * * Lazarus, come forth.

" * * * When the old system" (of medicine, to wit) "shall have quite vanished from the earth, and the new one shall be established, *then, for the first time,* will the Gospel of the kingdom of Grace be preached as Jesus ordered it to be preached, and received as God intended it to be received. * * *

" * * * The great want of the new science, is a school of our own, wherein the principles of harmony may be taught and explained to students. It is in the hope of persuading you to support such a school in connection with this hospital, that I have ventured to address you this day. * * * Give us only a school in which it (harmonic medicine) may be taught in its purity, and people who know how to practise it on the true principle,—the smallest dose of the right medicine,—and ere one white hair shall appear on the head of many here present, we will have that medicine in all our cities and in all our villages."

It must be admitted to be not very easy to imagine a theory of education more far-fetched, fanatical, or mischievous. The entire conception looks uncommonly like a last desperate shift to prop a sinking cause; and with a community abounding, as England does, in religious dupes, it might succeed in the hands of a man of talent, enthusiasm, boldness, and no principle.

But a serious omission has been left. No mention is made of a remedy. We have got the pathology of the primæval curse, but not the cure. Vaguely the author rants about "the medicine of love," "the one harmonic agent," "the proper dynamic medicine," "the harmonic medicine;" but he cannot condescend upon the

actual drug. The "Pathogénésie Brésilienne" is not so barren in invention. The very first article of the Brazil Materia Homœopathica introduces a new "specific for the hereditary itch." This specific is neither more nor less than the human louse,—the *Pediculus capitis* of naturalists. By this great discovery, says Dr Mure, "I imagine I have done a substantial service both to the theory and the practice of our art. Those only who devote themselves to such laborious researches, can appreciate the sense of inward enjoyment which attends such a conviction." How unlucky that the discovery had not been known to the Rector of Wickwar! who might then have finished his psoric argument with an appropriate pedicular conclusion.

Is homœopathy responsible for these fantastic absurdities? We think so. We will be reminded, indeed, that abuse takes not away use. It may be urged, that those who use a thing are not responsible for the doings of those who abuse it:—that simple homœopathists, therefore, are not to be taken to account for such theological vagaries as the Rio Janeiro doctrine of Physical Redemption, or the Wickwar creed of the Itch-curse. But is it not the fact, that the same sort of people who give or take the therapeutic globules have also endured the theological bubbles? Are not the physicians, peers, members of parliament, divines, and warriors, whose names flourish in controversial pamphlets as homœopathic doctors, patients, and patrons,—and whose signatures cover petitions for the coercive conversion of Faculties of medicine to the homœopathic standard,—the same individuals who figure as governors or contributors of the London Hahnemann Hospital? If so, then they, and such as they, must have constituted the audience who sat out the sermon on the itch,—the committee who collected pounds, shillings, and pence from the congregation,—and the indiscreet friends who encouraged the preacher to print his inspirations. And we have not heard that they have ever called on their diocesan to take account of the outrage on decent religion perpetrated in the Church of St Augustine in April last, or that they have declined the money extorted from their proselytes by such equivocal doctrine and such unsavoury pulpit eloquence.

After finishing the preceding observations, it has been pointed out to us, that we may have done the homœopathists great wrong in entertaining any doubt of their readiness to espouse as a body the doctrines of Doctor Mure and the Rector of Wickwar. The oracles of the sect in England are "The British Journal of Homœopathy," and the "Homœopathic Times." In the former, a long laudatory review of the trash from Rio Janeiro commences by describing the author as "the indefatigable Apostle of Homœopathy" [1849, p. 530]. In the latter, we are told that, at a dinner which was held by the friends of the Hahnemann Hospital after the itch-

sermon, and at which Lord R. Grosvenor was chairman, and the principal medical homœopaths of London were present,—the sermon was hailed as "another giant addition to the homœopathic literature of this country" [*Cheers*]. And in an editorial article it is distinctly stated, that the preacher "showed how the taint of sin, leprosy, is in our bodies; that it must be eradicated;" that "his admirable discourse, in respect of logic, was faultless,"—"a great achievement,"—and "must, of course, be published;" that there is great "reason to bless Him, whose dearest name is Love, that it has pleased Him to give us such an advocate;" that "the propagation of homœopathy is not only a good work; it is a holy task," &c. &c.

Really we had no idea that true religion in England was so near suffering a *Pathogénésie Brésilienne.*

Unto the Right Honourable the Lord Provost, Magistrates, and Council, Patrons of the University of Edinburgh, the Petition of the Undersigned Graduates of the said University, and Others, &c. Presented on Tuesday, 13th January 1852.

THE presentation of a monster petition to the superintending body of a University, praying them to concuss the consciences of its professors in the honest discharge of one of their most responsible duties, is an unprecedented event in the history of medicine in Britain, which deserves to be recorded in some more approachable quarter than the inaccessible records of a burgh magistracy. Therefore, as the Petition has been printed and circulated, and thus becomes a legitimate object of criticism, we shall take leave to acquaint the reader with its contents, as well as its authors.

It is well known that last year the Medical Faculty of the University of Edinburgh found it necessary to remit for farther examination a candidate for the degree of Doctor of Medicine, whose principles of practice appeared to them unsound and dangerous, and who also showed an imperfect acquaintance with some branches of medical learning. Instead of rejecting him at once, as the Faculty were fully entitled to do, they humanely granted him an opportunity of informing himself farther on the points in which he did not satisfy them, and allowed him a new trial in good time for the year's graduation, in the event of success. But the misguided youth, preferring to be made the tool of designing men, withdrew his name from the list of candidates, and has thrown himself into the arms of the enemies of his University. Of the various devices contrived by these enemies, with a view to damage its interests, and at the same time to keep themselves in the public eye,

the newest is a Petition to its Patrons, the Town-Council of the city of Edinburgh.

This Petition, after recounting the particulars of the candidate's adventures, as reported in our Number for October last, proceeds to charge the Medical Faculty of the University of Edinburgh with "requiring from a candidate an explicit pledge, limiting his future course and practice," being "a fundamental change," adopted "arbitrarily, and without the authority, or even the knowledge, of the Senatus, or of the Patrons of the University." It represents, "that this innovation, if adhered to, will be highly injurious to the progress of science, and to the morality of students, as well as greatly detrimental to the usefulness and to the reputation of the University of Edinburgh; and that those who find themselves thus debarred from pursuing their studies in whatever direction truth seems to call them, will be driven to other, and possibly to foreign universities, or to separate and independent institutions." It then goes on to glorify the species of quackery which has found favour with the petitioners; prays that the Patrons of the University will show it countenance; requests their "intervention, in order that any undue attempts to interfere with the full liberty of the students of medicine may be prevented in future, and that the honour, independence, and distinguished reputation of the University may be preserved." And it concludes by requesting more specially that "the honourable Patrons will cause the irregularity complained of to be brought under the immediate notice of the Senatus of the University, or will act otherwise as to their wisdom shall seem best."

The substance of the Petition may be set aside in a few words. The sapient subscribers, who have maliciously, ignorantly, or inconsiderately signed it, object to a candidate for medical honours being required to give satisfaction, that he is competent to practise medicine with credit to the school where he was educated, and with safety to her Majesty's lieges, according to the views entertained on these points by his examiners and teachers. But they have no objection—on the contrary, they have taken a world of trouble—to require, that these examiners shall, in the discharge of the most solemn and responsible of all their public duties, violate their consciences, and let loose upon society a set of men whom they honestly regard as either infatuated or designing, and in either capacity alike dangerous to the well-being of the community.

Looking at the matter in the point of view most favourable to the petitioners, and least favourable to the Medical Faculty, it is plain that, if the Patrons of the University entertain the prayer of the Petition, they will have to decide, whether there is to be a concussing of the consciences of one or two possible young men, who will be thought by all but the petitioners to be in the wrong, and to whom, by their own showing, it is open to go elsewhere for what they want,—or of twelve indubitable Professors, who are believed

by the world in general to be in the right, and who cannot evade a duty at all times disagreeable,—except indeed by the resignation of office, which it is possible that the Patrons of the University will look upon as not a very desirable alternative. And as to the special and very unusual mode here chosen for guiding the judgment of the Patrons, it is equally plain that they will have to choose between the opinions of 3337 labourers and bricklayers, carters and ploughmen, sailors and tailors, masons and quarrymen, weavers, bakers, joiners, shoemakers, policemen, &c. &c., and peers,—whose names we find appended to this Petition,—and the sentiments of thousands of the educated classes of the community, and even in the medical profession alone, who would come forward in aid of the Medical Faculty, were the Patrons entitled by law to interfere, and inclined to settle the question on the arbitrement chosen by the petitioners,—that is, by the public voice.

But who are the petitioners? Eight Peers, three members of the Commons, not being peers, eight generals, five admirals, a sprinkling of baronets; an Irish bishop and 170 clergy, chiefly of the English Church; a less proportion of the other educated classes of society; and a multitude of the merest labouring population, some of them so low in the scale of society that they can with difficulty write their names, or spell their designations. The peers are, the Earls of Wilton, Airlie, and Erne; Viscount Newport; Barons Kinnaird, Colville, Lindsay, and Gray. The members of the House of Commons, besides Lord Newport, are Lord Robert Grosvenor, Allan Elliot Lockhart, and Charles Powell Loftie. The only bishop is the occupant of the see of Down and Connor. The generals are, Lieutenant-Generals Birch, Brook, Doveton, Greenstreet, Hawker, Herbert; and Major-Generals Simpson and Willshire. The admirals are, Rear-Admirals Cator, Gambier, Henderson, Hole, and Trowbridge. In this list of twenty-six individuals, constituting the *Dii majores* among the patrons of homœopathy in the three kingdoms—for England, Scotland, and Ireland have all been ransacked for subscriptions—we are not aware of any one remarkably known for wisdom; or possessed of any other qualification entitling him to dictate to others on a question of conscientious conduct in a profession of which they are all profoundly ignorant. As for the peerage, we confess ourselves to be agreeably surprised that it is so scantily represented; and as to the number of the English clergy, we feel no surprise at all. Long before the invention of any English noun ending in *opathy*, England had constantly enjoyed the singular distinction among nations of possessing a genial clime for quackery. This singular privilege she greatly owes to two of her chiefest blessings,—her peerage and her church. In these two orders of society, both of them alike powerful, alike opulent, and similar in some mental weaknesses, there has always existed throughout the country an atmosphere ready to propagate any delusion or imposture in physic, however gross. Whence may have arisen a con-

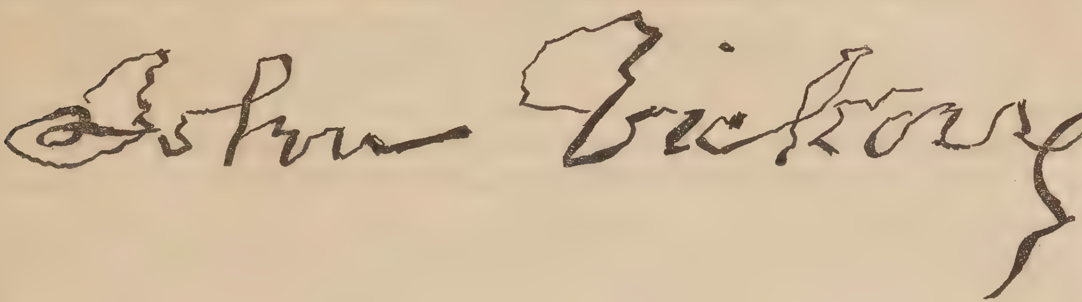
nection so startling, it is not necessary now to inquire. Sufficient for the present is the pregnant practical fact, that quack medicines, quack doctors, and quack theories, have ever found in England the readiest acceptance among its nobility and clergy. Homœopathy, therefore, like antecedent quackeries, could scarcely fail to find a peer and a churchman to back it.

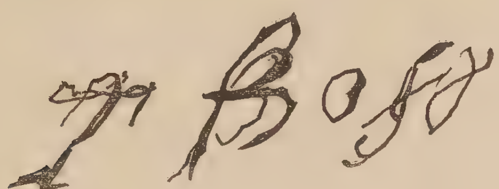
A detailed analysis of the whole subscriptions is out of the question, because we have not the requisite local knowledge of the districts in England which principally supply them. But a sketch of those who constitute the great mass of petitioners north of the Tweed, will satisfy most readers what right these people have to obtrude their advice in such a matter.

In the town of Selkirk, a dissenting clergyman heads a congregation, consisting of the town-clerk, a weaver, a dresser, a pressman, a slubber, a joiner, a mill-wright, a shoemaker, four cabinet-makers, and two tailors. In the adjacent parish of Ashkirk, the Free Church minister leads a flock of one stocking-maker, one joiner, one steward, a farmer and his two sons, two farm-servants, two labourers, and two millers. Not far off, in the same county, a farmer is followed by his gardener, two shepherds, six hinds, and two ploughmen. And at Ashkirk-mill, the miller and his men themselves contribute four sturdy signatures. On the other side of the Forth, the whole gardeners in the grounds of Camperdown, seven in number, give their support to the cause. And in the same county, the stone-quarries of Lochee, under the guidance of an aboriginal, who graduated last year at Edinburgh by successfully hiding his homœopathic talent, have supplied the heavy-handed autographs of three carters, four quarrymen, and fifteen masons.

In Edinburgh itself, 560 individuals have been prevailed on to sign the Petition. Probably sixty of these, or seventy at the most, belong to the educated classes of the community. The remainder consists mainly of all sorts of handicraftsmen ; among whom cabinet-makers, confectioners, and carters ; porters, printers, and painters ; smiths, spirit-dealers, and shoemakers ; bakers and bookbinders, ; labourers, grocers, joiners, masons, and tailors, are the most conspicuous,—accounting, in fact, for at least 240 subscriptions. We must not omit to add, nine policemen, seven sailors, and three soldiers of the garrison. Pre-eminent above all tradesmen are the tailors, who alone number 46 ; and one sheet contains thirteen of them in a row, who seem to have signed as they sat on their board, and to have then smoothed down the sheet with their goose. At one place a builder is followed by no less than twenty of his masons. Hard work some of the poor fellows must have had to put down their symbols, and indicate their calling. One styles himself a *Pinafortrte-maker*. Alexander Murdoch is a *Coach-bulder, Souttth clark streat;* Andrew Oliver is a *Cabnit-maker ;* and William Wilmore, a *Jewller*, might improve the orthography of a brother in trade,—Thomas

Jackson, *Gewler*, London. We here present two fac-simile specimens of the signatures :—





John Vickory, who designates himself *Gentleman*, appears to have dined before signing. The other, after vainly endeavouring to identify himself by a few desperate hieroglyphics, has been enabled, by some fair hand, to describe himself as "servant, George Square."

Among the educated classes of Edinburgh, are particularly distinguished four advocates, six clergymen of the dissenting communions, three accountants, five military men, six esquires of some place, chiefly temporary residenters, the Rector of the High School, the Auditor of the Court of Session, and eleven medical men, of whom eight may possibly be engaged in practice, two are retired practitioners, and one, who signs himself an "intending M.D.," was, to our certain knowledge, in the same predicament at least eleven years ago. We wish our limits would allow us to analyze the whole of this flaming catalogue. The result would surprise the reader. But, for brevity's sake, we must confine ourselves to the two most important denominations,—the lawyers and the medical practitioners.

As for the four advocates, whose profession may seem, in such a matter, to give their opinion more weight than that of others, they possibly deserve little mercy at our hands for putting their honoured title to such mean uses. But, having more consideration for one or two of them than they have had for themselves, we shall simply say—what the fact entitles, and their interference calls on, us to do—that it is not the position of any of them at the bar which has warranted them to give the colour of a legal sanction to these proceedings, by appending their signatures and designations; and that, if the Petitioners have no better authority for the lawfulness of the measures which they desire the Patrons of the University to attempt towards the Medical Faculty, we apprehend the Faculty

may safely regard the question proposed to be raised as not yet absolutely decided against them.

The eight signatures of medical practitioners are the following :—

George Edward Allshorn, M.R.C.S., Edinburgh, Homœopathic Chemist.
George B. Cochran, M.D.
James Lawrie, M.D.
John Rutherford Russell, M.D., Edin.
John F. Paisley, M.D., Glasgow.
James Russell, M.D., F.R.C.S., Edin.
George Easson Stewart, M.D., Edin.
Dionysius Wielobycki, M.D., Edinburgh.

These, for aught we positively know, may be all engaged in medical practice. One of them, however, we believe never to have been so engaged. Two we never heard of before. Two others do not even appear in the Edinburgh Post-office Directory. Of the remainder, one is only remarkable for being second editor of a periodical print called "The British Journal of Homœopathy;" another is remarkable in no respect whatsoever; and the last is an expatriated Pole, who, with his brother, was educated for four years by the Medical Faculty of Edinburgh, and exempted from all University fees,—a small kindness, for which both of them have expressed their great gratitude in the only way in their power, by signing this gagging Petition. We miss the signature of the Coryphæus of Scotch Homœopathy. Possibly he foresaw, that a request to coerce twelve Professors, if refused by the Patrons, might be disagreeably suggestive of a plea and necessity to concuss the remaining thirteenth.

Enough, we presume, has been said to illustrate the way of getting up a petition in favour of homœopathy. A few homœopathic practitioners signify their wishes to a few dupes, who have been their patients, in the learned professions and other educated classes, no matter what may be their credit in society; and straightway they come forth with a petition weighing four pounds, measuring sixty yards, and signed by a few thousand people, as insignificant, and as devoid of all weight and influence, as their own infinitesimal globules and dilutions.

Much has been lately alleged of the number of Edinburgh Graduates, who are supposed to have been converted to the creed, or to have put on the mask, of homœopathy. We give them as they appear in this petition :—

Black, Francis, Clifton.
Blyth, John, Dublin.
Brown, Samuel, Portobello.
Cochrane, George B., Edinburgh.
Cryer, William, Bradford.
Drysdale, John, Liverpool.
Devonport, James, Clapham.
Dudgeon, Rob. Ellis, London.
Frith, Richard, Newcross, Kent.
Gully, James M., Malvern.
Ker, Claudius B., Cheltenham.
Laurie, David C., Brighton.
Madden, Henry R., Brighton
Marsden, James L., Malvern.
Ransford, Charles, York.
Rogers, George, London.
Russell, James, Edinburgh.
Russell, John R., Edinburgh.
Stewart, George E., Edinburgh.
Strong, George, Ross, Hereford.
Traill, William, Belfast.
Wielobycki, Dionysius, Edinburgh.
Wielobycki, Severinus, London.
Wright, William, Birkenhead.
Wood, Neville, London.

In the English Medical Directory, fourteen others are put down as homœopathic practitioners. We are also aware of the existence of one or two more. But we have to do here only with those who have given their countenance to the Monster Petition.

Much has been said more particularly of the number of last year's Edinburgh graduates who are homœopathists; and six or seven is the number specified by the only individual who has committed his name to the statement. In this petition we find only one; who is that very individual, and a principal touter for the petitioners.

Indian Journal of Arts, Sciences, and Manufactures. Parts 1–7. Madras: 1852.

It is a mistake to suppose that the burning sun of Hindustan necessarily engenders habits of indolence in Europeans subjected to its influence. If, in a sultry clime, active out-of-door occupations are at certain seasons inconvenient or unsafe, and if the siesta of the East is a wholesome and blameless institution, it is equally certain that mental self-culture is in some degree independent of Fahrenheit, and may be practised with more of safety, comfort, and profit, than beer-swilling, tobacco-smoking, or absolute inertia.

In the numbers of the highly meritorious Journal now before us, we find abundant proof, that habits of industry, early acquired, may be preserved, even in the latitude of Madras; and that their exercise, when judiciously directed, may be equally a source of delight to their possessor, and of advantage to his fellow-beings. Dr Alexander Hunter, the editor of the "Madras Journal," in whom we are proud to recognise a fellow-student and graduate of the University of Edinburgh, has, during a nine years' residence in India, pursued a most honourable career. Amidst the multifarious duties of a military surgeon of the H.E.I.C., he has found leisure for a great variety of useful occupations, in which his early devotion to practical botany, mineralogy, chemistry, and geology, aided by great skill as a draughtsman, have enabled him to excel. His dominant idea seems to be, how he can best assist in developing the resources of British-India, and improving the condition of the natives. What he has done, and is still doing, the pages of his Journal will explain; and we shall simply enumerate the more remarkable of his efforts. He has introduced important improvements in the manufacture of cordage from the fibres of various plants;—has discovered excellent materials for the use of the potter—such as kaolin and gypsum—in localities where they are found to be peculiarly valuable;—has greatly improved upon the Indian modes of modelling, glazing, and firing earthenware;—has

established and superintends a school of design;—has diffused information on the fine arts, and given personal instruction to many in their various branches,—*e.g.*, drawing, modelling, lithography, and engraving on copper and on wood. The manufactures of colours and dye-stuffs, of paper, and even of printing ink, the composition of minerals, and the nature of organic remains, have likewise occupied some share of his attention. The reader of the "Indian Journal" will find in it a fund of curious information on these and other allied topics, and in the illustrative woodcuts and etchings by Dr Hunter and his pupils, will discover interesting proofs of the success of his teaching. We wish him and his Journal all the success which his philanthropic labours so richly merit.

Part Third.

CLINICAL REPORTS, LECTURES, ETC.

CLINICAL MEDICINE.—PROFESSOR BENNETT.

REPORT OF THE CASES OF PULMONARY DISEASES TREATED IN THE CLINICAL WARDS OF THE ROYAL INFIRMARY DURING THE LATTER HALF OF THE SUMMER SESSION 1851.—(*Concluded from* p. 70.)

Special Treatment of Phthisis Pulmonalis.

Under the head of General Treatment of Phthisis Pulmonalis, I have pointed out the means of meeting the three indications which should never be lost sight of in this disease. But every case requires a special treatment in addition, which will depend on the unusual severity of this or that symptom, or the existence of peculiar complications. It is to the undue importance given to this special, as distinguished from the general treatment, that I attribute much of that want of success experienced by practitioners. Thus it is by no means uncommon to meet with patients who are taking at the same time a mixture containing squills and ipecacuanha to relieve the cough; an anodyne draught to cause sleep and diminish irritability; a mixture containing catechu, gallic acid, tannin, or other astringents, to check diarrhœa; acetate of lead and opium pills to diminish hæmoptysis; sulphuric acid drops to relieve the sweating; and cod-liver oil in addition. I have seen many persons taking all these medicines and several others at one time, with a mass of bottles and boxes at the bedside sufficient to furnish an apothecary's shop, without its ever suggesting itself apparently to the practitioner, that the stomach drenched with so many nauseating things is thereby prevented from performing its healthy functions. In many cases there can be little doubt that this treatment of symptoms, with a view to their palliation, whilst it destroys all hope of cure, ultimately fails even to relieve the particular functional derangement to which it is directed. Still these symptoms require attention; but their causes, and the means

required for their relief, will be best understood by speaking of each in succession.

Loss of Appetite and Anorexia.—These are the most constant and important symptoms of phthisis, inasmuch as they interfere more than any other with the nutritive processes. If food, or its substitute, cod-liver oil, cannot be taken and digested, it is vain to hope for amelioration in any of the essential symptoms of the disease. Here I must guard you from making a mistake, into which the inexperienced are very liable to fall. Nothing is more common than for phthisical patients to tell their medical attendants that their appetite is good, and that they eat plentifully, when more careful inquiry proves that the consumption of food is altogether inadequate, and that they loathe all kinds of animal diet. You should never be satisfied with general statements, but determine the kind and amount of food taken, when you will be at no loss to discover, in the vast majority of cases, sufficient proof of the derangement of the appetite and digestive powers formerly alluded to. Very commonly, also, you will discover acid and other unpleasant tastes in the mouth. In all such cases, especially if too much medicine has been already given, you should allow the stomach to repose itself before giving anything, even cod-liver oil. Sweet milk with toasted bread, and small portions of meat nicely cooked, so as to tempt the capricious appetite, should be tried. Then ten drops of the Sp. Ammon. Aromat., given every four hours in a wine glassful of some bitter infusion, such as that of Columbo or Gentian, with a little Tr. Aurantii, Tr. Cardamomi, or other Carminative. In this way the stomach often regains its tone, food is taken better, and then you may try cod-liver oil, first in teaspoonful doses, cautiously increased. Should this plan succeed, you will be almost sure to observe amelioration in the symptoms.

Nausea and Vomiting.—Not unfrequently the stomach is still more deranged; there is a feeling of nausea and even vomiting on taking food. In the later stages of phthisis, vomiting is also sometimes occasioned by violence of the cough, and the propagation of reflex actions, by means of the par vagum, to the stomach. In the former case, the sickness is to be alleviated by carefully avoiding all those substances which are likely to occasion a nauseating effect, not overloading the stomach, and allowing it to have repose. I have found the following mixture very effectual in checking the vomiting in phthisis. ℞ Naphthæ. Medicinalis, ʒj.; Tr. Cardamomi comp., ʒj.; Mist. Camphoræ, ℥vij. M. ft. Mist. Of which a tablespoonful may be taken every four hours. When it depends on the cough, those remedies advised for that symptom should be given.

Diarrhœa.—This is a very common symptom throughout the whole progress of phthisis, at first depending on the excess of acidity in the alimentary canal, to which we have alluded, but in advanced cases, connected with tubercular deposition and ulceration in the intestinal glands. The best method of checking this troublesome symptom, is by improving the quality and amount of the food. The moment the digestive processes are renovated, this, with the other functional derangements of the alimentary canal, will disappear. Hence at an early period we should avoid large doses of opium, gallic acid, tannin, and other powerful astringents, and depend upon the mildest remedies of this class, such as chalk with aromatic confection, or an antacid, such as a few grains of carbonate of potash. When, on the other hand, in advanced phthisis, continued diarrhœa appears, and is obstinate under such treatment, then it may be presumed that tubercular disease of the intestine is present, and the stronger astringents with opium may be given as palliatives.

Cough and Expectoration.—At first the cough in phthisis is dry and hacking. When tubercle softens or bronchitis is present, it becomes moist and more prolonged. When excavations exist, it is hollow and reverberating. In every case cough is a spasmodic action, occasioned by exciting the branches of the pneumogastric nerves, and causing simultaneous reflex movements in the bronchial tubes and muscles of the chest. The expectoration following dry cough

is at first scanty and muco-purulent, afterwards copious and purulent. When it assumes the nummular form,—that is, occurs in viscid rounded masses, swimming in scanty clear mucus, it is generally brought up from pulmonary excavations. The accumulation of the sputum in the bronchial tubes is an excitor of cough; and hence the latter symptom is often best combated by those means which diminish the amount of sputum. When, on the other hand, the cough is dry, those remedies should be used which diminish the sensibility of the nerves. In the first case, the amount of mucus and pus formed will materially depend on the weakness of the body and the onward progress of the tubercle. Hence good nourishment and attending to the digestive functions is the best method of checking both the cough and expectoration; whereas giving nauseating mixtures of ipecacuanha and squills is perhaps the worst treatment that can be employed. There is no point which experience has rendered me more certain of, than that, however you may palliate these symptoms by cough and anodyne remedies, you thereby render the stomach intolerant of food, and so impede the curative tendency of the disease. On the other hand, nothing is more remarkable than the spontaneous cessation of the cough and expectoration on the restoration of the digestive functions and improvement in nutrition. When the cough is dry, as may occur in the first stage, with crude tubercle, and in the last stage, with dry cavities, counter-irritation is the best remedy, employed in various forms. Opium may palliate, but never cures.

Hemoptysis.—This symptom sometimes appears suddenly in individuals in whom there has been no previous suspicion of phthisis, and in whom, on careful examination, no physical signs of the disease can be detected. On other occasions, the sputum may be more or less streaked with blood; and lastly, it may occur in the advanced stage of the disease, apparently from ulceration of a tolerably large vessel. In all these cases the best remedy is perfect quietude, and avoidance of every kind of excitement, bodily and mental. Astringents have been recommended, especially acetate of lead and opium; but how these remedies can operate, I am at a loss to understand; and I have never seen a case in which their administration was unequivocally useful. I have now met with several cases where supposed pulmonary hemorrhage really originated in follicular disease of the pharynx or larynx, and which, with the supposed phthisical symptoms, were removed by the use of the probang and nitrate of silver solution.

Sweating I regard as a symptom of weakness, and therefore as a common, though by no means a special, one in phthisis. Here, again, the truly curative treatment will consist in renovating the nutritive processes, and adding strength to the economy. It will always be observed, that if cod-liver oil and good diet produce their beneficial effect, that the sweating, together with the cough and expectoration, ceases. On the other hand, giving acid drops to relieve this symptom, as is the common practice, by adding to the already acid state of the alimentary canal, is directly opposed to the digestion of the fatty principles which require assimilation.

Cancer of the Lung, Thyroid Body, and Lymphatic Glands of the Neck; Bronchitis.

Margaret Stewart, a cook, æt. 60, admitted into the clinical ward July 16, 1851. For some years back she has been subject to a short dry cough, which has never been troublesome except after cooking a larger dinner than usual. With the exception of an attack of diarrhœa when the cholera was prevalent, she has been more or less constipated. Has never suffered from epistaxis or other form of hemorrhage. Four weeks ago she first perceived a swelling in the neck, which, commencing in front, has gradually spread towards the right side. Latterly her breathing has become short and hurried; her strength has decreased, and the cough has been accompanied by considerable expectoration. On admission, the neck presents a prominent indurated swelling anteriorly, measuring about four inches in diameter, evidently owing to enlargement of the

thyroid body. A chain of enlarged glands extends from the anterior swelling round the right side of the neck, a little beyond the ear. She complains of great weakness, constant sweating at night, and cough with copious frothy expectoration. The chest is everywhere resonant on percussion. There are loud sonorous and moist râles heard over the whole chest, especially posteriorly and inferiorly. The vocal resonance is also unusually loud, but equal on both sides. The tongue is furred, dark brown in the centre, deglutition difficult, apparently from pressure of the enlarged cervical glands. The appetite is bad, with an acid taste in the mouth. Other functions properly performed. She continued in this condition for several days, during which iodine and counter-irritants were applied to the neck, and expectorants and antispasmodics taken internally to relieve the cough. The dyspnœa, however, gradually increased; deglutition became more difficult, and her strength diminished. On the 30th of July the urine was ascertained to contain albumen, which had previously not existed. She died without a struggle, August 5th.

Sectio Cadaveris, August 17th.—Body greatly emaciated.

Neck.—On dissecting the integuments from the neck on the right side, a considerable number of glands, about the size of a barley-corn and small pea, were observed in clusters between the platysma myoides and the sterno-mastoid muscle. A hard tumour existed in front of the neck, stretching along the whole front of the trachea, and over the great vessels on either side beneath the sterno-mastoid muscles, and posteriorly on the right side, as far back as the transverse processes of the vertebræ, and down beneath the clavicle to the anterior surface of the first rib, where it was firmly adherent to the periosteum. A prolongation of the tumour, about the size of two walnuts, passed beneath the sternum at its upper end, being attached to its periosteum. This prolongation on section presented the outline of a congeries of enlarged lymphatic glands, having a white appearance, in some places soft, and even diffluent, and yielding on pressure a copious milky cancerous juice.

Chest.—There were lax adhesions at various points on the pleura on both sides. The pleural cavities contained a little fluid, on the right side amounting to about five ounces. At the lower part of the left lung, and also at the back part of right lung, there was a small amount of recent membranous exudation. A multitude of small cancerous nodules were scattered throughout the whole of both lungs. Some were immediately below the pleuræ, and some in the substance of the organs. For the most part these masses were scattered pretty equally, being as numerous at the base as at the apex, and varying from the size of a millet seed to that of a small walnut. Some were of firm consistence, and others soft and friable, presenting various degrees of induration. They all on pressure yielded a copious milky juice. The mucous membrane of the bronchi was of a mahogany colour, and the tubes more or less filled with muco-purulent matter.

Abdominal organs healthy.

Microscopic Examination.—The cancerous juice squeezed from the cervical glands, and the nodules scattered throughout the lungs, contained numerous cancer-cells, which it is unnecessary to describe minutely here. Associated with these were a considerable number of round colourless corpuscles, varying in diameter from the $\frac{1}{150}$th to the $\frac{1}{100}$th of a millimetre in diameter. An unusual number of these cells also existed in the blood, as was determined both before and after death.

Commentary.—Cancer of the lung may occur in two distinct forms,—1st, That of disseminated nodules; 2d, That of infiltrated masses. In the former case there are no physical signs, or functional symptoms, which indicate the presence of cancer; in the latter there are unusual dulness, and resistance on percussion, increased vocal resonance and tubular breathing, or diminished respiration, according to the density and extent of the cancerous infiltration. If with these signs there be indications of the existence of cancer in other parts of the body, there will be little difficulty in forming the diagnosis; and

even should this be absent, the history of the case, advanced period of life, and the non-existence of moist rattles will, in the majority of cases, be sufficient.

In the case before us, the chest was frequently examined with great care, and was ascertained to be everywhere resonant on percussion. Loud sonorous and moist râles were heard on both sides, especially posteriorly and inferiorly. Hence there were all the signs of bronchitis, which was found afterwards to exist; but there was associated with them unusually loud vocal resonance, equal on both sides. It occurred to me at the time that this latter sign was merely indicative of diminished volume in the lungs; but, after the dissection, it became manifest that it was owing to increased density of the organs, from the disseminated cancerous nodules. Whether the conjoined signs of augmented or unusual resonance of the lungs, bronchitis, and increased vocal resonance, will prove diagnostic in such cases, further experience only can determine. Doubtless it will be always difficult to separate such signs, dependent on nodular cancer, from those connected with collapse of the lung, which Dr Gairdner has shown to be so common a result of chronic bronchitis.

Part Fourth.

PERISCOPE.

PHYSIOLOGY.

MESMERISM.—EXPERIMENTS AND INFERENCES.

The following statement was read by Dr Redfern, in the anatomical lecture-room of King's College Medical School, on the afternoon of Wednesday last, detailing the particulars of certain experiments in Mesmerism, performed within that institution, by Mr H. E. Lewis, on the occasion of that gentleman's recent visit to Aberdeen. Besides a large number of students belonging to Dr Redfern's classes, several clergymen and medical gentlemen were present. Dr R., before reading the report, stated that its preparation had been attended with considerable labour, and that it had been delayed longer than was anticipated to insure its being perfectly satisfactory to all concerned in it. He then read as follows:—

Examination of Mr Lewis's Experiments on Mesmerism, at the Medical School of the University and King's College.

22d November 1851.—Present: Professors Fyfe, Thomson, and Fuller, and Drs J. Williamson and Redfern.

Dr Redfern stated, that he had been induced to request the above-named gentlemen to assist him in the examination of certain of the phenomena which Mr Lewis professes to produce on the human body, at the earnest solicitation of the members of his class, and because he was anxious that there should be no good ground for the statement, that scientific men refused to examine such phenomena. Mr Lewis had been requested to name the time, and to bring with him any persons whom he thought well fitted to be the subjects of experiment; but, as Mr L. observed that he had nothing to do with any persons on whom he

had operated publicly in Aberdeen, it was agreed that the members of Dr Redfern's classes should be present, and that Mr Lewis should select from them those whom he might find sufficiently susceptible. It was suggested that it would be better for the students to retire after Mr Lewis had made his selection from them; but Mr L. thought their presence not objectionable, and they accordingly remained.

The experiments by which it was proposed to test Mr Lewis's power over those on whom he operated were as follows:—That Mr L. should produce whatever effects he thought proper upon any of the subjects of operation, and having done so, that he should retire into an adjoining room with three of the observers, who should request Mr L. to produce certain of a series of movements in the subject of operation, and note the *time* at which these requests were attempted to be carried out by Mr L. The other three of the party were to watch the person operated upon, and note any movements he made, and the *time* at which they occurred.

It was also agreed to request Mr Lewis to raise the mesmerised person from the floor, by holding his hand over him, which Mr L. stated, before the whole observers present, that he had actually done on a former occasion; and to cause the individual to perform any other acts which cannot be explained as the result of ascertained laws. Mr Lewis was made fully acquainted with the nature of the proposed experiments, and he stated that they were perfectly fair, and that he would most willingly do everything in his power to enable them to be properly carried out.

At Mr Lewis's request, all the parties present, with few exceptions, joined hands, and complete silence was preserved for about five minutes, during which Mr L. fixed his eyes intently on each individual in succession, and at the same time extended his arm towards him, keeping his own muscles in a state of extreme tension, and shaking his closed fist. He also occasionally advanced a step on the floor, and stamped his foot. Presently it was noticed that one of the students, Mr C., aged 20, who appeared to be paying strict attention to Mr Lewis's movements, began to incline forwards and to breathe hurriedly. Mr L. almost instantly noticed this, and then directed his attention more particularly to him, making passes downwards before him, and at length, having directed him to close his eyes, he told him that he could not open them again, which, however, he did, though with some apparent difficulty. It was then ascertained that this person had been in the same state before. On being asked how he felt, he replied that he felt rather nervous.

Mr Lewis next requested those who had felt any effects from his preliminary operations to come down from the benches, that he might act upon them more directly. About half a dozen came down, and having taken seats near each other, without joining hands, movements similar to those already described were made before them by Mr L. There were three who were selected by him for further experiment, including Mr C. above-mentioned.

Mr I., aged about 18, was the first, and he, after being told in a very peremptory manner by Mr L., that he could not open his eyes or move his leg, and that he would not feel pain when his hand was pinched, opened his eyes and moved his leg with some hesitation, and also said that he felt pain on being pinched. Mr L. next told him in the same tone, that he could not hold his hand and arm steady, Mr L. at the same time shaking his own hand by the side of that of Mr I. Mr I. brought the whole of the muscles of his arm into powerful action, and endeavoured by force to prevent the shaking, but slight tremulousness still continued. After this Mr L. insisted that the person could not shake his hand; it still shook, although more slightly.

The second was Mr G., aged 22, who had gradually passed, during the preliminary operations, into a state which can only be compared to that of a person affected by a profound soporific, attempting to keep himself awake, and smiling as if amused at his state. Mr Lewis told this person, successively, that he could

not rise from his seat, that he could not sit down after getting up, &c. At first, these acts were not performed; but after being sharply told by one of the observers to stand up, and then to sit down, whilst Mr L. was stating, in a commanding tone that he could not stand up, that he could not sit down, he did both with some hesitation. He was again operated on at a subsequent part of the meeting, with similar results.

The third was Mr C. before-mentioned, with whom nothing new was elicited, except that it was remarked that, when told to keep his arm steady, some trembling occurred. Mr L. immediately reversed his command, and told Mr C. that he could not steady his hand, and it continued to shake.

Other trials were made with the same individuals, and similar results followed. This closed the proceedings, and it was arranged that another day should be fixed by Mr L., and that he should endeavour to bring other more susceptible individuals for experiment.

Second Meeting, November 29.—Present: Professors Fyfe, Thomson, and Fuller, the Rev. Dr. Forsyth, Dr J. Williamson, and Dr Redfern.

Mr Lewis, as upon the previous occasion, requested perfect silence for some minutes, and went through his usual operations on the parties present, without their joining hands. He soon fixed his eye upon Mr M., a student of arts, aged 17, whom he had repeatedly operated on in public during the past fortnight. Mr M. immediately (and before a minute had elapsed from the commencement) started up with great violence, leaped from his seat, and sprang across the railing in front of him into the area, and confronted Mr Lewis, making numerous irregular movements with his arms, and advancing to Mr L., who retreated, and requested some one to try if he could restrain Mr M. A student attempted to do this, when a struggle ensued, during which Mr M. struck several blows at the person holding him, who at last set him at liberty. Mr Lewis made various movements before Mr M., such as commencing to take off his coat, moving his arms, coughing violently, &c., and in all of these acts Mr M. imitated him accurately.

Mr Lewis then suggested, that he himself would retire for a few moments, during which the gentlemen present might arrange with Mr M. that he should do something on a signal being given him after Mr Lewis's return. Whatever should be arranged for Mr M. to do, Mr L. said that he would prevent by an effort of his will. Mr L. accordingly retired with one of the observers; another gave Mr M. a piece of chalk, and requested him to write on the black board, when the signal was given, after Mr L.'s return. Mr Lewis re-entered, stared at Mr M., and made passes before him, when he evinced great excitement. After this had continued for some time, Mr Lewis was asked if Mr M. was in a fit state for the experiment. As the answer was in the affirmative, Mr M. was requested to do what had been arranged with him, and he immediately wrote the word "Lewis" on the board. Mr L. now approached him, and commanded that his hand should stop writing; Mr M. made a few other strokes; Mr Lewis continued to insist that Mr M.'s hand should stop, and by and by, on Mr Lewis pointing to a particular spot, Mr M.'s hand stopped there for a moment, and then made a few other long up and down strokes,—Mr Lewis making corresponding movements, which, by the careful observation of two of the observers, were commenced shortly subsequent to those of Mr M., and then proceeded simultaneously with them. Afterwards Mr Lewis carried his hand down nearly to the bottom of the board, and held it there; Mr M.'s hand followed with the chalk.

On turning round from the board, Mr M. took out his handkerchief to wipe the perspiration from his face, when Mr Lewis interfered, and having peremptorily insisted that the handkerchief was too hot and would burn him, Mr M. again wiped his face with the handkerchief, then passed it rapidly from one hand to the other, and threw it from him. Mr L. next made a succession of passes down Mr M.'s right arm, and having drawn his hand across Mr M.'s wrist, re-

quested the sensibility of the hand and arm to be tested. On pinching the arm, he winced; he was not observed to do this when the hand was pinched.

With a view to bring Mr M. "into sympathy with himself," before proceeding with the chief experiment determined on at the commencement of the investigation, Mr Lewis asked Mr M. if he would do what he (Mr L.) wished for a while, and having obtained Mr M.'s promise that he would, proceeded to persuade him that his name was Henry Lewis, and at length induced him to say that it was; he then suggested to him that they should act in concert, and have but one will, after which Mr L. got up, taking Mr M. by the hand, and they walked about together. This was repeated several times with slight variations, Mr M. imitating Mr L.'s movements. Mr Lewis now retired into an adjoining room, with three of the observers; the other three remained to watch Mr M., who was then sitting on a chair. After the experiment, the three absent parties returned into the Class-room, with Mr Lewis, when the notes taken by both parties were read at Mr Lewis's request. They were as follows:—

Notes of Mr Lewis's party.

h. m.

3 0 P.M.— * * * requested Mr Lewis to make Mr M. lie on the floor, with his face on the floor.

* * * at Mr Lewis's request went to class-room, and on return reported that nothing particular had been done.[1]

3 5.— * * * requested Mr L. to make Mr M. write the word "London" on the black board.

* * *, as before, reported nothing particular done.

3 9.— * * * requested Mr L. to make Mr M. ask Mr Fuller to give him leave of absence from his class on Monday.

Notes of Mr M.'s movements.

h. m.

3 1½., P.M.—Raised himself up in the chair, and shook himself.
3 2. —Slipped down a little—got up and sat down—changed his seat.
3 2½.—Rubbed his right hand (on his thigh), and his left arm with the right hand.
3 3¼.—Stamped on the floor, and moved his feet sideways—then got up and changed his seat again.
3 3¾.—Folded arms—put left hand behind.
3 4½.—Rocked his body from side to side.
3 5½.—Rocked again.
3 6. — Do. again—got up and walked round.
3 6½.—Sat down again—spread out his legs.
3 7. —Rubbed right side of head with right hand.
3 8. —Moved feet about, and struck them against each other.
3 10. —Again struck feet against each other, and on the floor for some time.
3 10¾.—Took his coat off his shoulders.
3 11½.—Put coat on again—rubbed hands—shook right hand.
3 12. —Took handkerchief and rubbed little finger of right hand—rubbed right hand again on knee and on handkerchief.
3 13. —Got up—stroked back of head—walked.

The three absent parties then returned into the class-room with Mr Lewis, when the notes of both parties were read to all present at Mr Lewis's request. During the time Mr L. was in the adjoining room silence was preserved,—so much so, that the movements made in one room were distinctly heard in the other, though every precaution had been taken, by closing the doors, that no commu-

[1] Mr Lewis expressed a wish at the end of each attempt to ascertain what results had followed in the next room. It was on this account that * * * * went in, but at once returned on finding that no corresponding results had ensued.

nication should exist. Mr L., in conducting these experiments, held his watch in his hand, and, leaning against a table, kept his eyes fixedly upon the floor, and in his first experiment he gradually and slowly bent his body towards the ground, occasionally shifting his feet. In the other room, the movements made by Mr M. were of a very definite and decided character.

The observers now wished to test Mr Lewis's power of controlling the action of gravitation, and therefore proposed to him to endeavour to make Mr M. stand on one leg, with the same side of his body and his foot closely pressed to the wall. Mr L. consented to make the attempt, but it failed completely. This led to Mr L.'s being asked more particularly as to the power claimed by him, at the meeting on the 22d November, of raising an individual from the ground by merely elevating his hand over him, when he distinctly stated that he had no such power, and that he could only influence a person lying on the ground so as to make him start up though others were endeavouring to hold him down.

Mr Lewis now directed attention to a boy, aged about 12, whom he himself had requested to attend, and whom he said he could influence without suggestion and by a mere effort of will, so as to prevent him doing what he was told to do by others. Mr L. thereupon gazed at the boy intently—apparent drowsiness ensued, and lasted for a short time, when Mr L. requested the parties around to ask the boy to make various movements. Accordingly he was successively asked to sit down—to stand up—to shut a door—to repeat a short sentence, &c., all which acts he performed, Mr Lewis all the while endeavouring by strenuous gesture, and as he said by an effort of his will, to prevent him. The boy was then shown a book, and asked what it was: as he was forming his mouth to answer, Mr Lewis shook his fist close before him, and said in his usual peremptory way that he could not speak; the boy then stammered out the first letters of the word book, but failed in pronouncing it fully.

Mr Lewis next asked the same boy if he had any bad teeth, and finding one, he wished him to have it taken out; the boy at first refused, and then somewhat reluctantly consented. This was objected to as being improper, Mr Lewis still wishing it, however, to show that the boy would manifest no signs of pain during the operation.

Mr Lewis now recognising Mr H., aged about 15, as a person on whom he had operated before, went up to him and finding that he had a headach, said that he would take it away. Mr L. now elevated his hand and arm, suddenly snapping his fingers before Mr H., and then declared that the headach was gone: Mr H. replied that he felt no more of it. Mr Lewis next pointed to the bench on which Mr H. was sitting, and insisted that it was burning, and that he could sit on it no longer; Mr H. began to move about, and after a little jumped violently up and got out of his place. After some quiet conversation, he was returning to his seat and had got one foot over the desk in front of his bench: Mr Lewis called out peremptorily that he could not take over the other leg, which Mr H. failed to do after apparently attempting it several times. During the conversation referred to, Mr H. expressed himself perfectly satisfied that Mr Lewis had him under his power to make him do whatever he wished.

A medical practitioner, who afterwards stated that he had himself influenced others "mesmerically," was now operated on by Mr Lewis, who thrust his hand several times close to his breast bone. The person then complained of uneasiness and increasing pain in his chest and throat, which he stated as somewhat similar to the effects of a galvanic shock. Shortly afterwards this gentleman's attention was taken up for some minutes by conversation, in order to give time to Mr Lewis, who had meanwhile placed himself behind him, and was apparently attempting to influence him by making passes all down his back and legs, but without effect.

Mr Lewis now (a few minutes before 4, P.M.) took his leave, an arrangement having been previously made with him privately by one of the observers that at 4 h. 5 min., when at his lodgings, he was to mesmerise Mr M. still remaining in the class-room. To carry on this experiment, it was necessary that the audience

should remain, and to induce them to do so, it was intimated that another experiment was going on, and that a reason would shortly be assigned for their detention. At 4 h. 12 m., Mr M. got up, suddenly came forward to a chair, and sat upon it in a state of apparent excitement for half-a-minute; he then rushed back, snatched his hat from the ground, and ran off.[1]

After Mr M. first got up, Mr H., before mentioned, bent down his head, and appeared to be in a state of great nervous excitement, refusing to leave on being pressed to do so. He remained in this state for half-an-hour, and was at last induced to go away, in company with two students who had been left in charge of him.[2]

Remarks.—In considering the results of the foregoing experiments, it must first be distinctly understood that it was not the intention of the observers to enter upon the examination of the ordinary results of suggestion, &c., induced by mesmerists before popular audiences. It must be obvious that until such experiments can be as successfully instituted upon adults as upon young persons, and until they will admit of the application of some proper test, and as long as all our information regarding them must be collected from parties who, appearing to have lost all volitional power, judgment, and consciousness, are in an unfit state for giving correct testimony, so many sources of fallacy must exist as to render all attempts to determine what is actual fact in the observed results of such experiments altogether impossible. On this ground it was resolved, before the commencement of these observations, to exclude all experiments which could not be divested of obvious sources of fallacy, and to rely only upon such as could be as completely freed from errors as ordinary experiments in physical and other sciences.

It becomes necessary, therefore, at once to distinguish between the experiments made, when all communication had been interrupted between the operator and his subject, and those which it was understood were to show the control of the operator over physical laws, as belonging to one class, and instituted at the suggestion of the observers; and those which were brought forward by Mr Lewis himself, and merely acquiesced in by the observers for the purpose of giving Mr L. every possible advantage, which repeated success might afford, as belonging to the other class.

Taking first the experiments which were devised so as to avoid all obvious sources of fallacy, the conclusions are so manifest as scarcely to require being pointed out. A reference to the total want of correspondence in point of time and character between the volitions and acts of the operator and of his subject, when in different rooms, shows at once that Mr Lewis exerted no influence whatever over the person whom he had deliberately chosen for that purpose after he had tested his susceptibility. Here also the decisive character—the variety and number of the acts performed by Mr M., during the absence of Mr Lewis—call for very marked notice. In directing attention to them, it may be sufficient to remark, that there appears no explanation at all applicable to them other than this, viz. :—that they were clearly of a deliberative character. Supposing the correctness of such an explanation, this view is strengthened by the striking fact before noticed, that the very marked effect first produced upon Mr M. resulted almost instantly on Mr Lewis directing his attention to him.

It is only necessary to point to Mr L.'s attempt to overcome the influence of gravitation in his effort to make Mr M. stand on one leg close to the wall, to prove that in this case at least not the slightest influence of the kind was exerted.

[1] We have been informed that Mr M. went to Mr Lewis's lodgings, and did not find him at home.

[2] Before Mr H. could be prevailed on to go home, he also went to Mr Lewis's lodgings, and, as he afterwards stated to one of the observers, was told by Mr L. that he had not attempted to influence him.

These experiments, therefore, afford no ground whatever for the opinion, that either Mr L. or any other person can influence another at a distance from him, or in the least degree counteract the influence of physical laws.

Proceeding now with the experiments which were adopted by Mr Lewis, or resorted to without any previous arrangement or care to avoid error, and taking first the effects of Mr Lewis's "suggestions," or rather his peremptory orders, it will be noticed that the failures were quite as complete, and nearly as numerous, as the instances in which these commands were obeyed. The experiment in which Mr Lewis endeavoured to prevent the performance of acts suggested by the observers to the boy aged 13, was one to which little exception can be taken; and in it Mr L. exerted no influence whatever over the boy, until a book was presented to him and he was asked what it was, when Mr L. stopped the complete answer by the prompt and determined statement that the boy could not speak. In the case of the medical practitioner who appeared so remarkably susceptible when Mr Lewis's movements were made in front of him, not the slightest effect was produced when far more energetic movements were much longer continued behind his back and without his knowledge.

As the last experiment was not previously contemplated, it is necessary, in noticing it, to state precisely the circumstances under which it was made. Mr Lewis, having stated that his time had expired, had left the room, after publicly receiving and acknowledging the thanks of the observers. In order to detain the whole of the parties present, they were informed that another experiment was going on, and that a reason would shortly be assigned for the request that they would remain for a little longer; it was known to almost all present that Mr Lewis was reported to have compelled different parties to come to him in spite of their own will at a particular hour; it was also known that for the success of this experiment (the only one Mr L. had performed in Aberdeen after his audiences had left) particularly susceptible persons were required, while Mr L. had been more especially successful with two of the parties present on this occasion. The time when Mr M. was to have been affected by Mr Lewis was exceeded by seven minutes; many persons meanwhile becoming anxious to get away, and attention being naturally directed to Messrs M. and H., the most susceptible persons present. At this moment, Mr M. got up suddenly and went direct to Mr Lewis's lodgings, as it afterwards appeared, and at the same moment Mr H. exhibited the excessively nervous state before-named. Subsequent inquiry proved that many parties present, totally unacquainted with the nature of this experiment, had come to the conclusion that Mr Lewis would endeavour to act upon Mr M. at a distance, and compel the latter to come to him, as it is stated that he did on a former occasion. Mr M. completely realised these expectations, but this was not the effect which Mr Lewis had agreed to endeavour to produce, neither did it occur at the time when Mr L.'s attempt was to have been made. Moreover, the state into which Mr H. immediately passed, on Mr M.'s getting up and going away, was quite as decided as that which Mr M. himself manifested; and what is of further importance, the latter as well as the former gentleman went off to Mr Lewis's lodgings before he could by any means be prevailed on to go home. This experiment, therefore, taken with all the circumstances manifestly attending it, shows very plainly that there was no relation whatever of cause and effect between the proceedings of Mr Lewis on the one hand, and those of Messrs M. and H. on the other.

In connection with the whole series of occurrences observed in the last-named class of experiments, it may be noticed that success attended wherever the person operated on had a full conviction of Mr Lewis's power, and when the latter commanded the effect by his utmost efforts of language, look, and gesture; and that failure always followed whenever gesture and look alone were resorted to—when the subject of operation was not aware of what was going on—and, frequently, when a command of the opposite kind was energetically given by another person. Further, when success in such experiments does occur, the evidence of its occurrence must be duly weighed, for that evidence is always obtained from

persons who, on the supposition that they are *actually under the influence* of some powerful agent (Odyle?) are, by this very circumstance, incapacitated from giving valid testimony, while, beyond their own statements, we possess no other information of the reality of the effects.

Seeing, therefore, that the foregoing experiments, taken altogether, offer no evidence whatever in favour of the possibility of exerting any influence, such as is usually styled mesmeric, upon persons at a distance—upon those in a separate room—or even upon a person in the same room as the operator, provided only that the person operated upon is not aware that another is attempting to produce such effects upon him; and that, when effects are produced in other ways, these do not admit of the application of any proper test, and yet are often associated with the most intense bodily and mental excitement, it follows that, when considered physiologically, a highly injurious result is to be anticipated. Again, there are the best reasons, derived from actual experience, for believing that very serious permanent afflictions may be occasioned by even temporary indulgences in such artificially induced states; and, therefore, the utmost caution is necessary in all instances. Moreover, as it cannot be shown that useful results ever accrue from the production of such effects, it becomes the interest and duty of every one at all susceptible of such influences, to avoid exposing himself to them; whilst, if such a person have any regard for the opinion of his fellows, and for his position in society, he will most strenuously exert himself to prevent the induction, in his own person, of a state in which one individual appears to give up everything to the caprice and suggestion of another—probably an unknown person—yielding himself to the other's will in everything, however ridiculous or improper; unreservedly and voluntarily ridding himself of every moral restraint—of his judgment—of everything, in fact, which especially characterises and ennobles humanity.

The above report on Mr Lewis's experiments on mesmerism, at the Medical School of the University and King's College, Aberdeen, has been drawn up by us, chiefly for the information and benefit of the medical students of the University, at whose earnest solicitation the experiments were instituted.

(Signed) P. Redfern.
Aw. Fyfe.
David Thomson.
Frederick Fuller.
James Forsyth.
Joseph Williamson.

—*From Aberdeen Journal*, Dec. 24, 1851.

ON THE RE-ESTABLISHMENT OF MUSCULAR IRRITABILITY AFTER DEATH.

Dr Broun-Séquard, of Paris, having at his disposal the body of a decapitated criminal, determined to ascertain if irritability could be restored to the muscles by injecting through them freshly drawn human blood. For this purpose, selecting for experiment the muscles of the hand, he employed blood taken from his own veins. Besides succeeding in restoring muscular irritability, he thus made the additional observation, that the blood, although scarlet in hue, from exposure to the air before injection, became quite dark-coloured, like venous blood, in its passage through the capillaries.

It was not till twelve hours twenty-five minutes after death that all trace of muscular irritability in the arm and hand had ceased, and the injection was commenced forty-five minutes after this. About half a pound of blood, drawn from himself, was defibrinated and filtered through linen. It was freely exposed to the air; as M. Séquard had found, by experiment, that in transfusing it is not necessary that the blood should be at the temperature of warm-blooded animals, so that when used it was of arterial hue, and had nearly the same temperature

as the surrounding air,—viz., 66° F. The whole of it was then injected into the radial artery, a little above the wrist, the process, occasionally interrupted and resumed, occupying eight or ten minutes. The blood issued black from the veins, also from the ulnar artery, though not to so great a degree. This change of colour could not be owing to the injected blood pushing before it dark blood previously existing in the hand, for the blood which escaped from the vessels, allowed to become arterial and re-injected, again issued black from the veins. This process was repeated several times with the same result. From the commencement to the termination of the injections thirty-five minutes elapsed, of which ten or fifteen minutes were actually occupied by the injections.

Ten minutes after the last injection, muscular irritability had returned to the hand. Having laid bare the muscles of the hand, he observed a considerable variety in their degree of irritability. Of the nineteen muscles, twelve were very excitable, three of these, the first and third lumbricales, and the palmaris brevis, contracting in their whole length from mere mechanical stimuli. The three muscles of the little finger, and one of the muscles of the thumb, were not so excitable; and two of the muscles of the thumb showed no trace of irritability. Perhaps coagulated blood obstructed the vessels of these muscles, or an abnormal distribution of the arteries may have existed. The irritability, or non-irritability, of the muscles before and after injection, was ascertained by transfixing them through the skin with needles, and then passing a galvanic current. Anxious, however, to discover, by actual inspection, if any trace of irritability remained before he commenced to inject, M. Séquard laid bare one of the dorsal interosseous muscles. It did not possess the slightest irritability; but in a quarter of an hour after injecting it was very irritable.

The rigidity of death also left the muscles after injection. This was shown by cutting all the muscles of the fore-arm that send tendons to the thumb and little finger, after rigidity was established, and previous to injecting. The thumb and finger continued stiff and immoveable. But after the injection, the little finger was quite moveable, and the thumb nearly as much so.

Two hours after injection, all the muscles were still irritable. An hour and a half afterwards there were still traces of irritability in the lumbricales and palmaris brevis. M. Séquard's observations were then discontinued till five hours afterwards, when he found that rigidity had returned to a feeble extent in the thumb and little finger.

In comparing these experiments with similar ones upon the lower animals, he concludes, that muscular irritability disappears much sooner after death in animals. That, while the dead animals received normal arterial blood projected by the heart of an animal of the same species, venous defibrinated blood, very irregularly injected by means of a syringe, sufficed to restore muscular irritability in the dead human subject.

He is of opinion that oxygen is the element of the blood that plays the most important part in this restoration of muscular irritability, of which he is to offer the proofs in another paper.

Twenty-seven hours after death, the experiments were repeated on the muscles of the foot of the same criminal, but with an entirely negative result; with the exception, that the red blood injected issued considerably darker from the veins.

Part Fifth.

MEDICAL NEWS.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

Meeting I.—*Wednesday, November 19th* 1851.—Dr Begbie, President, in the Chair.

ATROPHY OF THE KIDNEY FROM CALCULUS.

Dr W. T. Gairdner laid before the Society a preparation, showing complete atrophy of the kidney from calculous disease. There were nine concretions of different sizes, the largest about half an inch in diameter. From the relation of these to the vessels and the obliterated ureter, it was probable they had been contained originally in the pelvis of the kidney, the cortical and tubular substance of which had completely disappeared, leaving nothing but a very thin investment, which at first sight appeared to be mere cellular tissue. On more careful examination of this tissue, it was found to contain a multitude of minute cysts, exactly like those frequently found in the kidney, but so small, as not to be easily visible without a lens. Around this ghost of a kidney (which was hardly a line in thickness at any part), there was the usual fibro-cellular capsule, more thin and delicate than normal.

The whole organ, including the calculi, was about two inches in length, three quarters of an inch in breadth, and half an inch in thickness. The opposite organ had undergone a hypertrophy without disease, and weighed eight ounces; and a curious fact was, that the supra-renal capsules presented an exactly inverse proportion, the one on the side of the atrophied kidney being twice as large as usual, while that on the other side was almost completely atrophied. This was probably not accidental, as Dr G. had witnessed precisely the same arrangement on another occasion, the kidney of one side being deficient (probably from malformation), and the supra-renal capsule very large.

Dr Gairdner said, that in the absence of a section of the calculi, it was possible to suppose that they might be concretions, the result of scrofulous or other chronic primary disease of the kidney itself. But the appearance or form of the calculi was like that of ordinary urinary concretions; and their isolation from one another, and relation to vessels, ureter, and the surrounding shell of uniformly atrophied renal tissue, seemed to imply the correctness of the other view. Dr Gairdner was not acquainted with any well-recorded case in which atrophy of the kidney so complete as in the present instance followed on calculous disease, without inflammatory thickening, abscess, induration, or dilatation of the pelvis; but one case, somewhat similar to the present, is recorded by Cheston, and another by Rayer, both of which are mentioned in the work of the latter, "Maladies des Reins," vol. 3, pp. 466 and 473.

Dr W. T. Gairdner also showed a lung, which illustrated his published observations upon emphysema of this organ, presenting between many of the emphysematous lobules well-marked web-like expansions, formed by atrophied pulmonary tissue between two layers of pleura. Others of the emphysematous parts were separated by deep furrows, and there were also evidences of recent pulmonary collapse, and all the consequences of acute bronchitis.

Dr R. Mackenzie exhibited some specimens of calculi which he had lately removed from the bladder of a man. Sections of several of them were also shown so as to expose the nuclei, which were found to be ordinary horse beans. (The particulars of Dr Mackenzie's case will be found in the Clinical Reports, Monthly Journal for January 1852.)

Dr Andrew read a case of poisoning by atropin. (This case was published in the Monthly Journal for January 1852.)

MEETING II.—*Wednesday, December 3d,* 1851.—Dr BEGBIE, President, in the Chair.

CASE OF DISEASED LARYNX.

Dr James D. Gillespie exhibited a diseased larynx, removed from the body of a patient whom he had visited along with Dr Thomas Keith. There was extensive disease of the thyroid cartilage, which was laid bare by ulceration over a space fully an inch in length, at which part the cartilage was diseased throughout its whole thickness. The integument in front of the necrosed cartilage was very thin and discoloured, being upon the point of ulceration. The history of the case showed, in a forcible manner, the danger of delay in cases where tracheotomy was required. After undergoing local treatment by "swabbing," &c., for some months at the New Town Dispensary, the patient had been lost sight of, and was only seen again by Drs Gillespie and Keith on the day of his death, when he was unsuccessfully urged to have tracheotomy performed.

In answer to an inquiry of *Dr Spittal,* Dr Gillespie stated that there was little thickening and no œdema of the epiglottis and glottis. He ascribed the death to asphyxia, caused partly by the accumulation of discharge from the diseased surface, and partly by spasm of the glottis.

GELATINIFORM TUMOUR.

Professor Miller showed a tumour, about the size of a flattened orange, removed from the shoulder of a gentleman, aged 34. It had been accidentally observed six months, and since then had been growing slowly, without pain or uneasiness. Before operation, it had all the external characters of lipoma, or fatty tumour, being subcutaneous, elastic, lobulated, &c. It was found, however, to consist of a vast aggregation of masses, resembling nasal mucous polypi, attached to each other by fine peduncles, and exuding a tenacious gelatinous matter, which had been microscopically examined by Dr W. T. Gairdner, who found it to have no definite structure, and to contain scarcely any cells. At the centre of the tumour its structure was more homogeneous, the pedunculated bodies having become fused together to a considerable extent. The patient made a good recovery, and left town within a week after the operation.

Dr Spittal exhibited the anterior portion of the fourth rib, presenting a remarkable broad and flat expansion near the articulation with the cartilage.

ACCOUNT OF A CASE OF TRACHEOTOMY.

Professor Miller read a communication from David Johnstone, Esq., A.M., surgeon to the Royal Infirmary, Montrose, entitled a "Case of Tracheotomy,—an Account of a Foreign Body in the Air-Passages":—A lad, aged fifteen, in a fit of laughter, while cracking nuts, was seized with violent coughing, as he supposed from having swallowed a portion of the shell. The cough and distress continuing, a surgeon examined the throat, and passed a probang, without relief. When seen, some days afterwards, by Mr Johnstone, the symptoms plainly showed the lodgment of a foreign body in the air-passages, probably in the left bronchus. Tracheotomy was resolved on, and was performed on the seventh day after the occurrence of the accident. The trachea and larynx were carefully

examined with the finger and probe, with and without chloroform. In applying this anæsthetic agent, no stupor could be induced, until a sponge, saturated with it, was applied to the wound, in addition to the ordinary mode of administration. The foreign body, not having been found in the larynx or trachea, search was made in the left bronchus, by means of a polypus forceps; but without success. After bleeding had ceased, the wound was brought together by sutures; but these were removed on the day following. Pain and other inflammatory symptoms followed, indicating acute affection of the left lung; but yielded to leeches, with mercury and tartar emetic. On the tenth day after the operation, an inflammatory relapse occurred, but again yielded to antiphlogistic treatment. On the twenty-eighth day after the occurrence of the accident, a violent fit of coughing, with pain and dyspnœa, occurred, threatening fatal suffocation. This attack having lasted twenty minutes, sudden and permanent relief was experienced, by ejection of the foreign body through the mouth. On the thirty-eighth day, the patient was carefully examined, and found free of disease.

Some discussion followed the reading of this case, chiefly on the details of the treatment; *Mr Syme, Mr Spence,* and *Mr Miller,* stating their opinions on the subject. *Dr Bennett* and *Dr Spittal* referred to two cases, illustrative of the consequences attendant on the permanent lodgment of foreign bodies in the bronchi. In these cases the foreign bodies were found after death in the interior of excavations which had been recognised during life. The symptoms had been those of chronic pulmonary disease, with an ultimately fatal issue.

The Society proceeded to the election of office-bearers for 1851-52. The following gentlemen were elected in the usual manner:—

President.—James Begbie, M.D.

Vice-Presidents.—William Seller, M.D.; Douglas Maclagan, M.D.; J. S. Combe, M.D.

Councillors.—Charles Sidey, Esq.; Alexander Keiller, M.D.; W. Burn Murdoch, M.D.; Robert Paterson, M.D.; Charles Bell, M.D.; James Miller, Esq.; David Wilson, M.D.; William Robertson, M.D.

Treasurer.—Robert Omond, M.D.

Secretaries.—John Taylor, M.D.; W. T. Gairdner, M.D.

The following gentlemen were elected ordinary members:—Dr J. W. Begbie, proposed by Dr Taylor, seconded by Dr W. Robertson; Dr G. T. Beilby, proposed by Dr Coldstream, seconded by Dr D. Maclagan; Dr John Gillespie, of Leith, proposed by Dr Robert Paterson, seconded by Dr W. Robertson.

The following gentlemen were elected non-resident members:—John Tait, Esq., H.E.I.C.S., Dunse; James Syme, Esq., surgeon, Alloa.

The *President* announced that he had received, very shortly before entering the room, a printed letter from Professor Henderson, addressed to him in his official capacity, and transmitted through the Secretary, with a note stating that it was for the information of the Society. The President said he had not himself had time to peruse the letter, and he submitted to the Society the question, whether it should be read that evening.

Mr Syme moved that Professor Henderson's letter lie on the table, seconded by *Dr Myrtle.*

Mr Miller moved, as an amendment, that Dr Henderson's letter be read, seconded by *Dr W. T. Gairdner.*

After some conversation, in the course of which it appeared that Professor Henderson's letter was designed for immediate publication, and had actually been advertised in the newspapers, as intended to appear on the following day; and after remarks by Professors Christison and Simpson, Dr Alexander Wood, Dr Douglas Maclagan, &c., the Society divided, first on Mr Miller's amendment, and afterwards on Mr Syme's motion, when the latter was carried by a large majority.

Mr Syme then moved, in conformity with the resolution of the Society at last meeting, "That Dr Henderson having publicly professed homœopathy, his name

be deleted from the list of members,"—seconded by *Dr Fowler*, of Corstorphine, and carried without opposition,—Mr Miller dissenting, "on the ground that a letter, addressed to the President, and referring to the resolution of the previous meeting, had been received from Dr Henderson while still a member of the Society, which letter the Society had refused to hear; although, for aught that they knew, it might have contained important statements bearing on the matter in question." (The above reasons of dissent were handed to the Secretary in writing by Mr Miller.)

Dr Burt moved, "That Dr M'Donald of St Andrews having publicly professed homœopathy, his name be deleted from the list of members,"—seconded by *Dr Myrtle*. Carried unanimously.

Dr Simpson moved, "That Dr M'Leod of Ben Rhydding having publicly professed homœopathy, his name be deleted from the list of members,"—seconded by *Dr Christison*, and carried unanimously.

Dr Alexander Wood moved, "That Dr Ransford of York having publicly professed homœopathy, his name be deleted from the list of members,"—seconded by *Dr Malcolm*, and carried unanimously.

EDINBURGH PHYSIOLOGICAL SOCIETY.

SESSION II. (*Winter* 1851-52.)—MEETING I.—22*d November* 1851.

Professor BENNETT, President, in the Chair.

ADDRESS OF THE PRESIDENT.

The object which this Society proposes to itself is the advancement of Physiology. By Physiology, we understand a knowledge of the functions of all living beings, whether plants or animals, in every condition in which they exist,—embryonic, or fully formed; healthy, or morbid. We consider that what is called disease arises from an excess or diminution of normal function, and consequently we repudiate the notion of separating physiology from pathology. The means we propose to employ are,—1st, The investigation of vegetable and animal structures, aided by the best optical instruments that can be procured. 2d, Chemical analysis of the matter of which that structure consists. 3d, A careful comparison of all organic forms, vegetable or animal, in their various phases of development, normal or abnormal; and 4th, Every kind of experiment, physical, chemical, physiological, or therapeutical, calculated to further the object we have in view.

It is a fundamental rule with us to admit as members those only who are both willing and able to assist us. Unfortunately, some persons possess one quality but not the other. We, therefore, demand from every candidate for admission evidence of his powers in original investigation. It is not expected, nor is it to be desired, that our numbers should be great; but if we can secure that every member present is animated by a true spirit of scientific inquiry, our great end will certainly be attained. Already we possess amongst us most efficient representatives of the botanical, anatomical, chemical, pathological, clinical, and veterinary establishments of this city, and as the advantages of the Society become known, we shall doubtless receive the aid of those who cultivate other branches of knowledge. The admirable system of appointing committees to report on long memoirs, to investigate doubtful points, and extend research in new directions, has been found to work so beneficially that it will be continued.

Every thinking man who pays attention to the present state of medicine must feel convinced that it can only be advanced by cultivating physiology in the extended sense we have given to it. It is by determining the relation between physical, chemical, and vital forces; by discovering the laws which regulate reproduction, nutrition, and innervation, that we can alone ever hope to arrive at

correct therapeutics. Practical men apply scientific discoveries for the good of mankind, but it is the few patient and laborious investigators who make the discoveries themselves. Here we put aside all considerations of art; and, disregarding its empiricism on the one hand, and its charlatanism on the other, endeavour to extend the great physiological basis on which its rational study can alone be founded. In this way, I trust the Society will constitute a powerful means of stimulating the minds of its members to associated as well as individual labour, and that ultimately it may be recognised as a useful instrument for advancing the science it was instituted to promote.

1. *Dr Bennett* showed the skull and heart of a boy, who died of congenital cyanosis. The latter showed the usual malformation in such cases,—a communication between the two sides of the heart, through the ventricle. The cranial bones were remarkably thin; and on their internal surface presented numerous furrows, which had served to lodge blood-vessels, but which were not enclosed by bone inferiorly, from an arrest of development in the internal table of the cranium.

2. ANTHROPO-PHYSIOLOGICAL DISCOVERY. BY GEORGE GORE, ESQ., BIRMINGHAM.

A careful consideration of man's past intellectual history indicates the existence of a certain chronological order, in which the various branches of human knowledge have been, and must be, necessarily evolved; and to show that there is a certain logical dependence or natural relation existing between them, whereby the complete development and clear understanding of any one branch of human knowledge is dependent on the complete development and prior understanding of certain others.

The order indicated is,—1st, Logic; 2d, Mathematics; 3d, The sciences of inorganic nature, viz., gravity or universal attraction, motion, including that of solids, liquids, and gases, chemical affinity, heat, light, electricity, and magnetism; 4th, The sciences of organic nature, viz., anatomy and physiology of vegetables and animals; 5th, The science of man's social relations, viz., politics; and 6th, The science of man's moral relations.

In this order of the various sciences, each one is composed of, and dependent upon, the whole of those that come before it in the series; and in the development, or in acquiring a knowledge of any one of them, the whole of those that precede it must be used as *means* of subjecting it to the dominion of the intellect.

These principles apply most definitely to the study of the science of human physiology; for as it is composed of, and dependent upon, all those sciences that come before it in the logical series, it can only be clearly understood, and become thoroughly subjective in the human mind, by the prior knowledge and mental subjection of those that precede it.

The order of natural dependence, and the order of study, necessary to obtain clear and correct views of human physiology would be,—1st, Logic; 2d, Mathematics; 3d, Laws of the inorganic forces of gravity, motion, including that of solids, liquids, and gases; chemical affinity, heat, light, electricity, and magnetism; 6th, Vegetable and animal anatomy; and 6th, Vegetable and animal physiology.

This order of the natural dependence of the science of human physiology upon certain other sciences is shown,—1st, Upon logic, in the necessity of using sound reasoning in deducing correct conclusions from physiological phenomena; 2d, Upon mathematics, in calculating the influence of time, volume, and other relations of number on physiological actions; and 3d, Upon the various sciences of inorganic nature it is also evident; *for wherever, or under whatever circumstances, matter is found to exist, there will be found the various forces of inorganic nature; and, on the contrary, whenever these forces are made manifest to our sense or our reason, they are always produced or developed through the medium of matter.*

The frame of man being composed of matter, and manifesting the various physical forces of gravity, chemical action, heat, etc., therefore contains and is subject to the influence of those forces, in addition to which it contains, and is subject to, the influences of the forces peculiar to organic life and man,—viz., vital power, nervous power, and mind, which complicate the actions, and somewhat obscure the manifestations, of the physical forces within it.

That the whole of the forces of inorganic nature, as well as the forces peculiar to organic structures, are present and correlative in the frame of man, is, however, decidedly manifest, as the application of any one of them internally or externally to his system, or the alteration of any one of them in any way, from any change taking place within or without it, interferes with and affects all the rest.

This mutual interference and correlation of the organic and inorganic forces in the frame of man, and the consequent correlation of the science of human physiology with the various physical sciences, indicates the necessity of studying the laws of the various physical forces, as well as those of the vital forces, in order to obtain clear views of human physiology: and the general correlation of human physiology with all other branches of human knowledge, indicates that the surest course to physiological discovery is to acquire a thorough knowledge, in logical order, of all those sciences which precede physiology, also of physiology and psychology, and then apply it to physiological actions, with a full recognition of the relative degree of influence which each force is likely to share in the phenomena; and to expect, as results, not the discovery of ultimate causes, but of new facts and laws, showing new relations existing between the forces of organic and inorganic nature. By such a course alone can the science of human physiology be thoroughly evolved, and become subjective in the human mind.

But as the laws of some of the physical sciences which precede human physiology in the natural order of development, are not yet evolved, and consequently the sciences themselves are not yet thoroughly understood and ordinate in the human mind, it is evident that the progress of development of physiological science is at present greatly dependent on the progress of development of the various physical sciences, and can only become thoroughly developed when those are thoroughly understood: this should be remembered when deducing conclusions from physiological phenomena, as portions of results may be due to those unevolved physical laws.

It is the condition of the present age, with regard to physiology, as it was of previous ages, with regard to the simpler sciences,—viz., to be obliged to wade through error in the acquisition of truth; and it will continue to be so until the period arrives when all the most important laws of the physical and vital process shall be evolved.

This period is steadily approaching, when all great discoveries of important laws in organic and inorganic science will be at an end; when we shall be able to apply all those laws in harmonious combination to the logical explanation of physiological phenomena, the true definition of human physiology will then be a science which includes all the relations of the organic and inorganic forces in man, and the true solution of all inquiries in human physiology will then be found in these relations of the physical and vital forces.

In the practical application of the foregoing principles and remarks to anthropo-physiological discovery, it is astonishing how rapidly a knowledge of our ignorance grows upon us, and how many questions of importance crowd upon our mind. Little is yet known of the relations of electricity to the vital forces, still less of the relations of magnetism to those forces, the influence of the magnetism of the air we breathe, or of the electric currents of the human body upon the nervous and vital forces, are not yet known. These, and many other questions, crowd upon our mind when applying those principles and remarks to human physiology, and show most forcibly how much remains to be known in this interesting science.

Notwithstanding so much remains to be developed in this branch of human

knowledge; yet, as in all other experimental sciences, discoveries can only be effected by close and long-continued study, and much original experiment, by constant consideration of the various facts and laws in physical and physiological science to suggest new ideas, by suggesting new forms of experiment to test the correctness of all new ideas, and trying them, and by minutely examining all results obtained. In this manner alone can correct original information in human physiology be evolved.

Dr W. T. Gairdner pointed out that the views of Mr Gore on the subject of the mutual relation and succession of the sciences corresponded closely with those of M. Auguste Comte, as developed in his "Philosophie Positive."

DEVELOPMENT OF OVA IN INSECTS.

3. *Dr Cobbold* exhibited, under the microscope, ova of the "*Penthaleus Capidarius*," one of the acaridæ closely allied to the common harvest bug. In the present instance, they were found attached to pieces of granite; and for the specimens before the Society, the author was indebted to Stephen Jackson, Esq., of Ipswich, who had, during the late summer, picked them up on the sea-shore at Vallö, in Norway. Dr Cobbold more particularly called the attention of the Society to the form of the ova, and the morphological changes which the embryonic coverings underwent during the development of the germ into the mature embryo or larva, alluding at the same time to a very similar form of insect egg belonging to one of the noctuæ, and figured in the great work of Swammerdam, Plate XXXIII., Figs. 1 and 2. The paper was accompanied with drawings illustrative of the varied forms of insect ova, together with the changes which had been seen to take place in those of the above-named insect.

Dr Bennett observed, that the further development of the numerous minute ova which were scattered on rocks, in water, and through the atmosphere, was a subject that was exciting great interest. It had been shown, that certain entozoa were developed to a certain extent in one animal, and more fully in another, who fed on the former one. Hence one stage of development had been discovered in mice and fish, a further one in cats and sea eagles. The assistant of Professor Van der Kolk, at Utrecht, had succeeded lately in tracing the origin of certain entozoa to vegetable infusoria.

ON THE PHYSIOLOGICAL ACTION OF THE CYTISUS LABURNUM, OR COMMON LABURNUM TREE. BY DR J. W. BEGBIE.

This very common and very beautiful leguminous plant has for a long period been known to possess poisonous properties, but nevertheless appears not to have received the amount of attention it deserves from the commonness of its occurrence on the one hand, and the severity of the symptoms it produces as a poison on the other.

The subject somewhat recently received great interest from a case of secret poisoning by the bark, which was the subject of a justiciary trial in this country. Dr Christison was consulted in the case; for an account of it, and of an interesting experiment made by Dr Ross, at the suggestion of Dr Christison, Dr Begbie begged to refer to the sixtieth volume of the "Edinburgh Medical and Surgical Journal." Dr Traill, in his "Outlines of Medical Jurisprudence," and Mr Bonney, in a recent volume of the "Lancet," have recorded cases of accidental poisoning by the seeds of the plant. Some cases of accidental poisoning both by the bark and seeds, which had come to the author's knowledge, were detailed in further illustration of the subject. In these, irritant symptoms had followed when the amount taken had been small, and purely narcotic when a large quantity had been swallowed. All cases of accidental poisoning Dr Begbie had been able to hear of, had occurred among children; and though the tree was a very common inhabitant of France, he had not been able to find any notices of cases of accidental poisoning by it in the French journals. Messrs Chevalier and Lassaigne, two French chemists, had separated an alkaloid, uncrystallisable, and of a bitter taste, from the seeds; this they had called cytisine.

Dr Begbie had made several experiments on animals, by which he found that in small doses the larburnum bark and seeds act as powerful irritants, and in large ones as narcotics. In the latter he had always observed symptoms showing the implication of both brain and spinal cord; whereas in cases of poisoning in the human subject, where the more threatening action had been induced, the symptoms were only cerebral.

Alcohol appeared more thoroughly to dissolve the active principle than water, alcoholic extracts and tinctures acting more powerfully than watery infusions.

The author terminated with the following general conclusions from his observations and experiments on the subject:—

1st. That the ripe seeds, bark of the root and stem, and unripe pods of the Cytisus Laburnum are eminently poisonous.

2d. That the plant is properly classed under the division of the narcotic acrid poisons, being irritant in small doses, and acting with remarkable energy on the nervous system in large.

3d. That, from the many disagreeable symptoms which attend its physiological action, it cannot be looked to as likely to prove of use as a therapeutic agent.

5. *Mr Allen Dalziel* presented a specimen of hair from a caterpillar, having under the microscope a complex branched structure.

6. *Dr W. M. Dobie* presented a specimen of muscular fibre, prepared by him for minute examination; which led to some conversation in reference to Mr Dobie's published observations on this subject, in which *Dr Bennett*, *Dr W. T. Gairdner*, and *Dr Cobbold*, took part. A committee of the entire Society was appointed to examine and report on Dr Dobie's observations.

7. *Dr W. T. Gairdner* presented a specimen of remarkably atrophied kidney, apparently the result of calculus, in which the renal tissue was reduced to a thin shell of areolar texture, containing a multitude of very minute cysts. (See report of Medico-Chirurgical Society, p. 177.)

CANCER OF THE KIDNEY.

8. *Dr W. T. Gairdner* exhibited a remarkable specimen of fibrous cancer of the kidney, of which he had made a microscopic examination previous to its being deposited in the University Museum. The peculiarity of the growth was in the almost complete absence of the succulent material which formed the ordinary types of cancerous deposit. The greater part of the present tumour was opaque, ochrey-coloured, and granular, yielding a small quantity of opaque matter, containing only fatty granules and the products of disintegration of tissue. Around this on one side was a species of capsule, of the consistence of fibro-cartilage, and of fibrous structure, containing nothing like cancer-cells; and it was only after some search in the thin lamina which intervened between these two portions, that the large nucleated cells commonly found in cancerous growths were discovered.

9. *Dr W. T. Gairdner* showed a heart, presenting on the endocardium of the left ventricle (*septum ventriculorum*) an appearance of white fibrous lines and rugæ, somewhat concentrically arranged, and composed of ordinary white fibrous tissue, like that of tendon or of cicatrix. The heart was otherwise normal, but there was an aneurism of the arch of the aorta, which was very much and generally diseased. No considerable traces of atheromatous deposit existed in the heart, and the appearances exhibited by Dr G. were different equally from the ordinary appearances of atheromatous disease, and of rheumatic vegetations.

COMPLICATED INTESTINAL INVAGINATION.

10. *Dr W. T. Gairdner* exhibited a very extreme specimen of intestinal invagination, previously to its being deposited in the Museum of the University. It occured in a child, which died a few weeks after birth. The intestine pro-

truded three inches beyond the anus. On careful examination, it was found that the protruding portion contained the invaginated caput cœcum coli; and the appendix vermiformis could be traced almost directly upwards from the extreme end of the prolapsed part. The upper end of the preparation showed that the ascending and transverse colon, carrying with it a considerable but unknown amount of the small intestine and mesentery, were closely impacted within the descending portion of the colon; and several probes and portions of bougie, passed into the invaginated part, showed that it presented, at more than one point, secondary invaginations, of minor extent, which gave to the disease an exceedingly complicated character.

Meeting II.—*December* 6, 1851.—Professor Bennett, President, in the chair.

1. *Dr Bennett* showed under the microscope two preparations; one, which he had received from Professor Schrœder van der Kolk, exhibiting a section of the spinal cord of man, showing the termination of the nerve tubes in ganglionic corpuscles; the other, a preparation of the minute structure of muscular fibre by Dr Dobie. This latter Dr Bennett exhibited, partly with a view of demonstrating the excellence of Oberheuser's microscopes.

2. The Secretary read the following communication from *Mr Struthers*:—

CALCAREOUS CYSTIC TUMOUR OF THE LIVER.

A tumour, feeling about the size of the closed hand, was noticed in the dissection of the abdomen, projecting behind and below the liver. It was very hard, and slightly moveable. It was connected above with the lower and back part of the right lobe, from which it seemed to grow. To the left side it touched the vena cava inferior, but without compressing it. Behind it lay on the diaphragm, by the side of the spine; and below it lay on the right kidney, which was somewhat pushed down by it. On endeavouring to remove the tumour, it was found to be intimately united to the liver, and both were removed together. About one-third of the tumour was imbedded in the hepatic substance, and on endeavouring to separate it from the liver, it was found necessary to divide and tear the actual substance of the organ. There was not even a condensed cellular layer between, but the lobules of the liver adhered intimately to the walls of the tumour. It appeared, therefore, not to have been a tumour pressing *on* and then *into* the liver, but one growing in the substance of the organ, although projecting out of it. The supra-renal capsule was carefully looked for; but, from the length of time (six weeks) which had elapsed since death, nothing distinct could be seen of it, although a small mass of yellowish cellular tissue was seen, and supposed to be the remains of the capsule, atrophied from the pressure of the tumour. The gall-bladder and bile-ducts were free and normal. The tumour, when removed, was about the size of a middle-sized orange. On one side, where it projected into the liver, it was hard; on the other, where the opening now is in the preparation, it was elastic and fluctuating. There was no opening at any part. On opening the softer part, it was seen to be filled with a soft glairy fluid, deeply coloured by bile, and resembling the contents of an egg beat up. There was no calculus or other hard body in the interior.

The subject having been dead six weeks before the tumour was examined, no attempt was made to examine the contents microscopically. The subject was a male, seventy-two years of age. He had acted as letter-carrier to an institution in town till within eight days of death, which was caused by dysentery.

On examination of the now dried preparation, it will be perceived that a considerable part of the wall is calcareous, this being the part which projected into the liver; and that most of the interior is coated over with a fibrinous-looking layer. The white elongated calcareous patch is the part which was crossed by the vena cava.

This tumour may be supposed to have been originally a simple cyst in this

part of the liver, becoming large, and then in old age its walls undergoing the calcareous change; but this I leave for the consideration of the more pathological members of the Society.

FIBRO-NUCLEATED TUMOURS.

3. The Secretary read a communication from *Dr Murchison*, founded on four observations of "fibro-nucleated" tumours, detailed in Dr Murchison's inaugural dissertation (1851), and illustrated by drawings of minute structure. The following remarks were made by Dr Murchison on this class of tumours:—

In bringing these four cases of tumours before the attention of the Physiological Society, I would suggest to its members, as an interesting subject for discussion, the propriety or non-propriety of separating *fibro-nucleated* tumours into a class distinct from that of *fibrous* tumours.

Naked nuclei interspersed among the fibres are present in greater or less quantity in most fibrous tumours; and, indeed, Vogel remarks:—"In none but mature and perfectly-formed tumours are nuclei ever absent." It is true, one may form a distinction between those tumours which consist of fibrous tissue formed by the splitting up of the walls of nucleated cells, the nuclei of which may remain imbedded among the filaments, or may ultimately disappear, and those tumours which are formed by nuclei and nuclear fibres without the intervention of cells. This I believe is the distinction which Dr Bennett draws between fibrous and fibro-nucleated growths. According to this definition, the two first only of the above described tumours would be properly denominated fibro-nucleated.

Nuclei may form fibrous tissue without the intervention of cells in one of two ways. The nuclei may elongate and become themselves transformed into fibres; the fibres developed in this way, however, are of the yellow elastic variety; while the fibres of the fibro-nucleated tumours, which have been described, belong to the white variety, and must have been developed by the other process,—viz., by the nuclei elongating and splitting up a surrounding hyaline substance into delicate parallel filaments. Now, in the case of a tissue composed of white fibres with interspersed nuclei, it would, in most cases, be very difficult, if not impossible, to determine whether the nuclei are those of cells whose walls have become split up into fibres, or whether they are nuclei which have split up into filaments a previously hyaline matrix. The absence of all vestiges of cells in the latter case is not a sufficient ground of distinction; for even in ordinary fibrous tumours, all traces of the original cell structure may have quite disappeared; and, indeed, in the same tumour we may have at one part a tissue consisting entirely of filaments and nuclei *without* any cells, and other parts, of nucleated cells becoming transformed into fibres.—(*Obs.* 37.)

For my own part, I am inclined to consider the distinction which has been drawn between fibrous and fibro-nucleated tumours, as in a great measure arbitrary; and that the latter are only a variety, or, perhaps, more correctly speaking, a particular stage, in the development of the former. The whole subject, well deserves further investigation.

Dr Bennett remarked, that in giving the name Fibro-nucleated to a certain class of tumours, he only intended to express an histological fact. Dr Murchison's excellent drawings, and his valuable cases, show that a structure composed of nuclei and of fibres does exist; and the term fibro-nucleated applied to such structures, is therefore as appropriate as the names of fibrous, fatty, and epithelial are, as distinctive of certain other forms of growth.

STRUCTURE AND DEVELOPMENT OF THE CANAL OF PETIT.

Dr Cobbold laid before the Society the following observations, on the canal of Petit, and its formation in the embryo.

It has been very generally held that the hyaloid membrane, as it approaches the margin of the crystalline lens, splits into two laminæ; or, as Petit[1] origi-

[1] Histoire de l'Academie des Sciences. Paris, 1726.

nally describes it, is *doubled*, and again uniting at the margin of the lens, encloses a space, named by him "*canal godronné*." This opinion has undergone various modifications.

Zinn pointed out that the anterior of the two laminæ presents a structure different from that of the posterior. The former commences, according to this anatomist, anterior to the margin of the capsule of the lens; and after forming the anterior wall of the canal, terminates externally on the surface of the hyaloid membrane. He considered it to be a membrane distinct from the hyaloid; and it has since been described as the membranula of Zinn.[1]

Haller, with his followers, as well as the second Monro and the Bells, abandoned the description of Zinn, and believed the laminæ vasculosæ retinæ to be continued forward as the anterior wall of the canal of Petit.[2]

It is unnecessary here to cite the various conflicting statements which have been made regarding the questions of the passage of the anterior and posterior walls of the canal of Petit—considered as productions of the hyaloid or not—over the anterior and posterior walls of the capsule of the lens.[3]

The recent descriptions of the membranula of Zinn, under the name of "Ligamentum suspensorium," by Professor Retzius of Stockholm, has added most important details in explanation of this difficult structure; and it has been still further elucidated by the excellent observations and lectures of Mr Bowman.[4]

If the external coverings be removed from the eye of a calf or lamb at full time, leaving the vitreous body and lens, with their membranes, entire; and if the membranula of Zinn, which is usually considered as the anterior wall of the canal of Petit, be examined with a power of thirty diameters, a number of minute specks, having the appearance of foramina, are brought into view. These specks Jacobson supposed to be apertures of communication between the canal of Petit, and the posterior chamber, allowing the aqueous humour to pass freely from the one to the other.[5] If these specks are more minutely examined, they will be found to be nuclei situated below the membranula of Zinn; and in a rolled or folded portion of the hyaloid, which constitutes essentially the canal of Petit; and exhibits, like the hyaloid in the rest of its extent, a nucleated structure.

If the membranula of Zinn be now removed, a distinct view will be obtained of these nuclei imbedded in a membrane, which is arranged in a ring-shaped, festooned, and hollow fringe, extending all round the margin of the capsule of the lens, and in the situation of the canal of Petit. I have represented this fringe in fig 1, as it appears after raising the membranula of Zinn, which, when completely removed, allows the outer margin of the fringe to curl forwards and inwards, exhibiting in its surface numerous radiating folds, and a festooned arrangement at its free margin. Each of these folds and festoons is somewhat distended by the fluid contained within the ring-shaped cavity of the fringe; and is separated from the others by crevices which, as well as the festoons and folds, do not appear to be permanent, but due to the gathering or puckering together

[1] Zinn.—Descriptio Oculi Humani. Gottingæ, 1780.

[2] Haller.—Disputationes Anatomicæ. Gottingæ, 1750. Monro, Alexander.—Elements of Anatomy. Edinburgh, 1825. Bell, Sir Charles.—Anat. and Physiology of the Human Body, 7th edit. Vol. III. London, 1829.

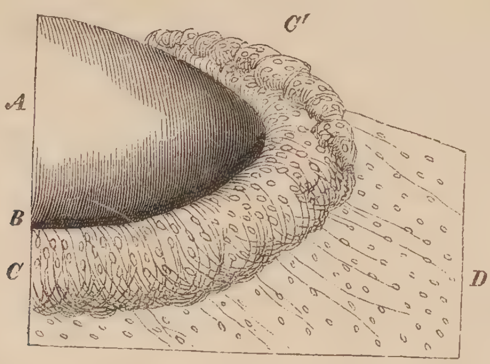
[3] Arnold.—Anatomische und Physiologische Untersuchungen ueber des Auges des Menschen. Heidelberg, 1832. See also Ammon's Zeitschrift, p. 9. Hannover, in Muller's Archiv. for 1845, p. 476. Delle Chiaie.—Oss. Anat. sull occhio umano. Naples, 1837. Hueck.—Die Bewegung der Krystalline. Dospat., 1836. Ribes.—Mem. de la Soc. d'Emulation, VIII., p. 631. 1847. Duges.—L'Institut., No. 73, 1834. Knox.—On the Philosophical Anatomy of the Canal of Petit.—Edinburgh Royal Soc. Trans. for 1826, Vol. X. Cloquet.—Anatomy of Human Body, translated by Knox, p. 560. See also Encyclopedia Anatomique for 1845, p. 682, where extensive information is given by Huschke on this subject.

[4] Bowman.—Lectures on the parts concerned in the operations on the Eye. London, 1849.

[5] Jacobson. Suppl. ad Opthalmiatr. Copenhag., 1820.

of the entire fringe round the margin of the capsule of the lens. The crevices present the appearance of curved lines, sweeping from the margin of the lens

Fig. 1.

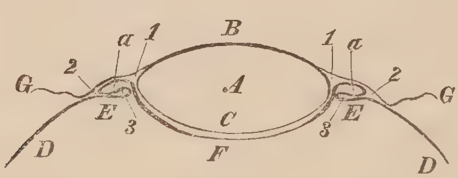


A, crystalline lens, with its capsule. B, point at which the membranula of Zinn has been detached. C, festooned hollow fringe, folded upon itself at C. D, hyaloid membrane, with nuclei upon its under surface.

over and between the festoons, and returning on the deep surface of the fringe, so as apparently to cross one another, particularly when the entire structure is compressed.

From this arrangement, it appears probable that the circular hollow festooned fringe is formed by the hyaloid membrane folded upon itself, as represented in fig. 2, from behind forwards and inwards, D E, D E, to the margin of the capsule of the lens; then outwards again in front of E, E; and lastly, inwards by the

Fig. 2.



margin of the back of the capsule of the lens, towards the centre of which it becomes extremely thin, and scarcely demonstrable (at F, fig. 2). The hyaloid thus cuts off from the space which contains the vitreous humour the ring-shaped cavity, *a*, fig. 2 of the circular fringe.

The constrictions which make their appearance when the canal of Petit is distended with air or injection, are produced partly by the festooned and folded arrangement of the hollow ring-shaped fringe of the hyaloid, partly by a number of fibrous bands, connected externally to the membranula of Zinn, and attached internally to the margin of the capsule of the lens.

The membranula of Zinn, G G, fig. 2, is the point described by Professor Retzius, of Stockholm, as the suspensory ligament of the lens. It consists of two layers, and only forms indirectly, or in a supplementary manner, the anterior wall of the canal of Petit,—being situated in front of, applied against, and confining the festooned ring-shaped fringe of the hyaloid.

As I do not in this communication enter upon the consideration of the interesting structure and connections of the membranula of Zinn, I have merely represented it passing from the front of the margin of the capsule of the lens, shutting *in* the festooned hollow ring of the hyaloid, and raised from the surface of that membrane on which it lies. G G, fig. 2.

The explanation I have given of the manner in which the hyaloid is folded, so

as to form the cavity of the canal of Petit, is borne out by the examination of the eye in earlier stages of formation. At first the ring-shaped fringe, when relieved from its coverings, exhibits the form of a blunt circular ridge, or obtuse elevation, a transverse section of which is represented in fig. 3. Its subsequent phases are exhibited in figs. 4, 5, and 6.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

In the adult eye, it is no longer a loose fold, merely confined within the space it occupies, but is adherent by its exterior surface to the hyaloid behind, and to the membranula of Zinn in front. This adhesion in the adult accounts for the structure not having hitherto been observed, and indicates in the embryo the existence of three ring-shaped spaces, 1, 2, 3, fig. 2, communicating originally with one another, being the three corners of the cavity,—between the hyaloid, the membranula of Zinn, and the margin of the capsule of the lens,—which contains the festooned hollow fringe under consideration.[1]

PHYSIOLOGICAL ACTION OF QUININE.

The Secretary read, on the part of *Dr Alex. Robertson*, a paper on the action of quinine in removing ague. The object of the paper was to show that quinine acts chiefly as a stimulant, more gradual and permanent in its action, but in other respects similar to the alcoholic stimulants. Dr Robertson remarked that the action of this drug on the nervous system had been mentioned in a prominent manner by all who had made its physiological effects the subject of experiment; and that there was reason to think that its action on the vascular and digestive systems might be, as in the case of alcoholic stimulants, secondary to the functional changes in the nervous system. The main difference between quinine and alcoholic stimulants in their effects on the system was, that while both produced in large doses a species of intoxication, accompanied by vascular excitement, and often by vomiting, &c., the effects of quinine were much more gradually developed, and likewise more prolonged than those of alcohol. Dr R. argued that this analogy of action was likewise to be traced in the effects of these therapeutical agents in intermittent fever, the paroxysms of which could often be arrested by large doses of alcoholic stimulants not less effectively than by quinine. To the latter remedy he ascribed no *specific* power of neutralising the malarious influence, considering it simply as a permanent and powerful stimulant of the nervous system, sustaining and fortifying it in its re-action against the depressing effects of the ague-poison.

[1] This Paper forms a short abstract of the author's Inaugural Dissertation, which obtained one of the gold medals adjudged by the Medical Faculty of the University of Edinburgh. August 1, 1851.

ARSENIC NO POISON.

This is the age of revolutions. We are now to be taught that, instead of a poison, arsenic is a condiment, possessing some of the properties of the elixir of life. In "Chambers' Journal" for 20th December last, it is stated on the authority of a correspondent in Germany, who derives his information from the documents relative to a late trial in Austria, for poisoning with arsenic, that in some parts of Styria, many of the peasants acquire the practice of eating arsenic habitually, as others use opium and tobacco ; and without injury so long as they keep up the stimulus. The effect is to produce a fresh look, a certain plumpness of figure, a blooming complexion, an extraordinary improvement of the wind and facility of climbing, and the expression of exuberant health. Not the least trace of arsenical cachexy is discernible. But when the vice has been fairly contracted, it cannot be abandoned without general discomfort, anxiety, salivation, burning in the throat and stomach, spasms in the gullet, difficult breathing, and other signs of arsenical poisoning, which are dispelled only on resuming the arsenic. The quantity to begin with, is a piece "of the size of a lentil, which in weight would be rather less than half-a-grain." But it must be gradually increased; and a man of sixty, who had been an arsenic-eater for forty years, had come to take at every dose "a piece about the weight of four grains." The primary authority for these wonders seems to be *Von Tschudi*, the Peruvian traveller, who adds, that in Peru, and especially Bolivia, corrosive sublimate is also a similar luxury of life.

Statements so surprising, so contrary to all previous facts and principles, so serious in their influence on the gravest practical questions, ought not to be put forth without extreme caution ; and we regret to find in a respectable periodical such a statement made on authority so slender, apparently for no other end than to feed the appetite for the marvellous. It is well known, that in medical practice, single doses, much less than those here said to be taken with impunity by beginners, produce in general violent effects; and that doses even less still produce an arsenical cachexy, when continued for a few weeks, or months at most. As we have been asked, however, in various quarters, by professional friends, in town and country, what truth there may be in the alleged facts, we reproduce them here,—with the caution, that we do not yet know any sufficient authority for them, and that some great mistake may be apprehended. One mistake in the statement is evident. A bit of arsenic as big as a lentil will weigh much more than half-a-grain ; for an average lentil, which is not half the density of arsenic, weighs a grain and a third.

P.S.—A correspondent informs us that the alleged habit of arsenic-eating is not a new discovery, and in proof incloses the two following extracts from foreign periodicals. Perhaps some of our Austrian correspondents may enable us to authenticate or contradict the accuracy of these somewhat marvellous statements.

"It is well known that old worn-out horses gain an appetite, strength, and spirit, by the use of arsenic; and a pigeon, which often got arsenic, was observed to have its appetite increased, and its movements more lively."—*Vogt's Arzneimittellehre,* 1 Bd. s. 507.

"There is scarce a district of Upper Styria in which, in at least one house, arsenic may not be found under the name of Hydrach. Orpiment., &c. It is used for diseases of the domestic animals, against vermin, and also as a stomachic to increase the appetite. A peasant in my presence showed, with the point of a knife, how much arsenic he took daily, and without which he said he could not live. I estimated the quantity at about 2 grains. It is also said to be used as a seasoning for cheese, and, indeed, several cases of poisoning by Styrian cheese have occurred, and one but lately."—*Medic. Jahrb. des Oster. Staates,* 1822, s. 99.

B.

THE "MEDICAL TIMES AND GAZETTE."

The following letter was transmitted to the editor of the "Medical Times and Gazette" for publication, but not having been inserted, is presented to our readers, who may learn from it how far the united Journals are actuated, in practice, by those principles of fairness, and that sincere desire to promote the diffusion of medical science which they so loudly profess.

Ever since it was proposed to remedy obstinate strictures of the urethra by external incision upon a director passed through the contracted part of the canal, the "Medical Times" and "Medical Gazette" have pertinaciously and virulently opposed the introduction of this practice, not scrupling to characterise it as mischievous and dangerous, or to publish as unquestionable evidence whatever was said against it—no matter by whom—while they treated with suspicion or total disregard the facts accumulated in its favour by experience the most public and unimpeachable. Now that truth having prevailed, the operation is established as a useful addition to the resources of surgery, instead of offering frankly, as some compensation for past injustice, the credit which may be due for the introduction of this treatment, the "Medical Times and Gazette" are endeavouring to connect it with any dead or living man, except the one to whom it properly belongs. In the progress of improvements, it is always a good sign of their appreciation when attempts are made to rob the authors of the merit due to them ; and we therefore regard this proceeding, on the part of the united London Journals, as the best compliment they could pay to the remedy of stricture by external incision.

To the Editor of the "Medical Times and Gazette."

Sir,—In the "Medical Times" for the 13th December last, page 618, it was stated :—" He (Mr Syme) has the merit of having revived, with others, an operation which, some few years ago, received condemnation as dangerous and unfit for general performance." With reference to this statement, I requested you to say when, where, and by whom the operation had been performed before I proposed it. You replied, in the first instance, that the information desired would be found in Malgaigne's "Operative Surgery," which contains no allusion whatever to the operation in question ; and when again asked to make good your statement, referred me to the Surgery of Desault, who died more than half a century ago, for the account of an operation to *relieve retention of urine*, which it does not appear that he ever performed, and which his editor, Bichât, has justly characterised as useless.

You say (*Medical Times and Gazette*, January 17, 1852, page 72) :—" And now, *we* 'beg to request' Mr Syme that he will reply to our question, asked with no ill-feeling towards himself, but solely in the cause of truth, Does he still call himself the originator of the '*Incision exterieure?*'" If you mean by this expression, the simple act of opening the urethra upon a grooved director, I certainly lay no claim to it, as being a procedure no less ancient than lithotomy by the *apparatus major*, of which it constitutes an essential part. But if you understand by "incision exterieure," the remedy of stricture by external incision upon an instrument previously introduced through the contracted part of the canal, I do maintain that this mode of treatment originated with myself, and shall continue to do so until it is shown when, where, and by whom the operation was performed before I proposed it.—I am, &c.

JAMES SYME.

Edinburgh, 19th Jan. 1852.

DR HENDERSON.

Dr Henderson having been expelled from the Medico-Chirurgical Society unanimously,—or, at least, with the dissent of only one member,—in order we presume to divert attention from this fact, has by various letters and advertisements

in the Newspapers endeavoured to make it appear, that the statement in the last Number of this Journal, relative to the account of the proceedings of the Society which we published in December, was inserted in order to prevent the Society from expressing their disapprobation of the speeches made by Mr Syme and Dr Simpson. We therefore think it right to state distinctly, that the sole object of our notice was to explain the informality of which we had inadvertently been guilty, in publishing the transactions of the Society a month too soon.

As for the allegations of Dr Henderson, with regard to the Conductors of the Journal, we have merely to say, that they are no less unfounded than those which have already received a public and unqualified contradiction from the council of the Medico-Chirurgical Society.

ITCH INSECT.

Most of our readers must have seen the *Acarus scabici* under the microscope, or are at least acquainted with the figures of the creature which have been published. It appears that the male insect has, until lately, eluded observation, but has been at last dragged into light by M. Lanquetin, of Paris. The amiable parasite is described in the "Union Médicale," and is said to be only half the size of his better half.

PUBLICATIONS RECEIVED.

Braithwaite's Retrospect of Medicine. July to December, 1851. London. Simpkin, Marshall, & Co. 1852.

The Medical Circular and General Medical Advertiser. No. 1. London. 1852.

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Lectures on the Diseases of Infancy and Childhood. By Charles West, M.D. Second Edition, enlarged. London. Longmans. 1852.

Hygiea Medicinisk och Pharmaceutisk Manads-Skrift. Trettonde Bandet. Oct. 1851, und Supplement.

Nederlandsch Weekblad voor Geneeskundigen. Eerste Jaargang. Januarii.—October. Amsterdam. C. G. Van der Post. 1851.

On the Natural History, Physiological Actions, and Therapeutic Uses of Colchicum Autumnale. By J. M'Grigor Maclagan, M.D., Edin. Edinburgh. Sutherland & Knox. 1852. (Reprint from this Journal.)

Speech at the Medico-Chirurgical Society, Relative to Homœopathy; with Notes on the Peculiar Opinions of Some Disciples of Hahnemann, &c. By James Y. Simpson. M.D. Edin. Sutherland & Knox. 1851. Second Edition.

Medical Report of the Kent County Lunatic Asylum for 1850-51. Maidstone. 1851.

History of the Epidemic Cholera in Chatham, Rochester, and Stroud in 1849. By Thomas Stratton, M.D. Edin. A. & C. Black. 1851. (From Edinburgh Med. and Surg. Journal.)

On Improving the Condition of the Insane. By Henry Monro, M.B., Oxon. London. Churchill. 1851. Articles 1 and 2.

On Herniæ or Ruptures. By David Tod, M.R.C.S., &c. London. Renshaw. 1851. Sixth Edition.

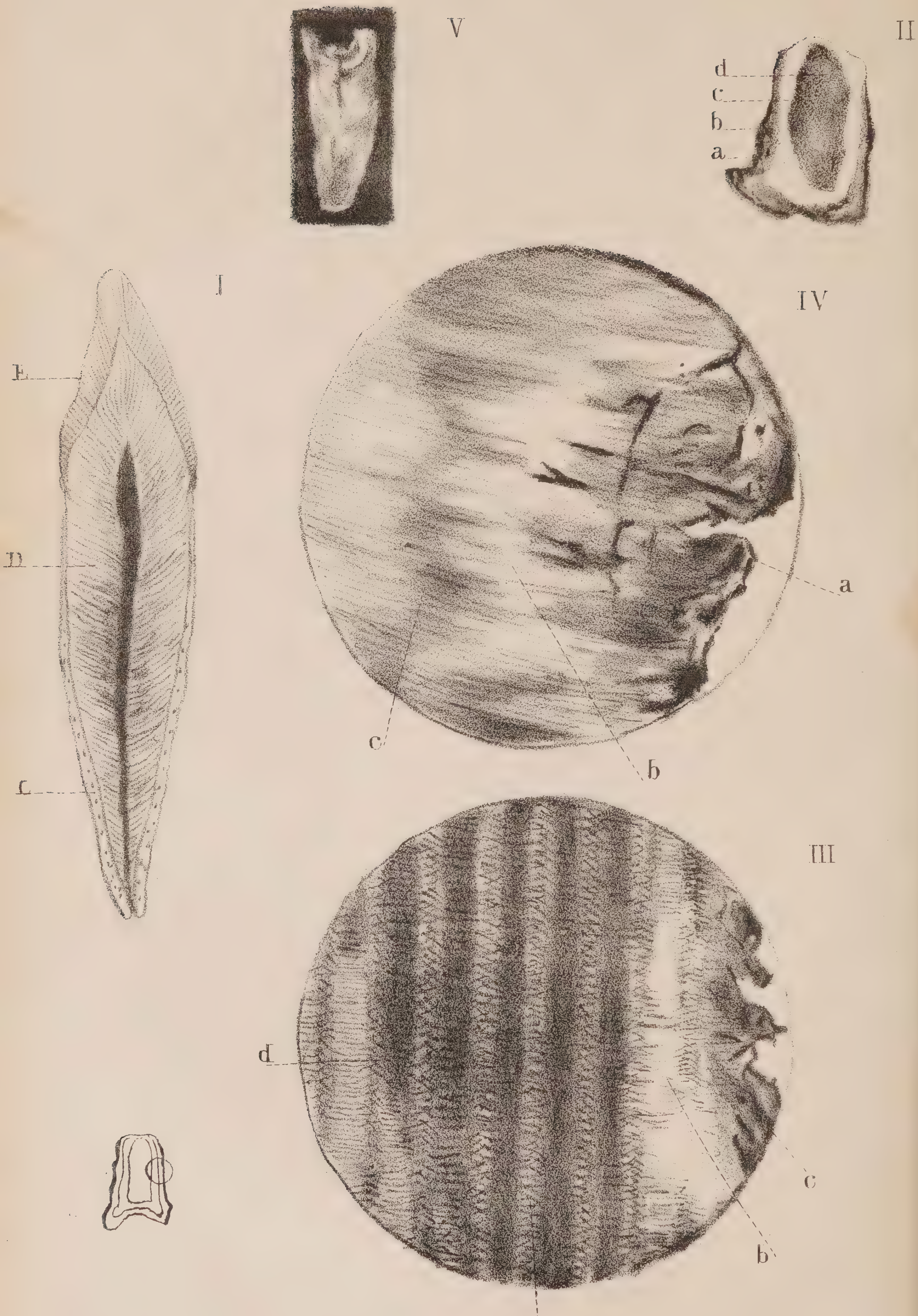
On Mesmerism: Experiments and Inferences. Aberdeen. Dec. 1851.

Di Alcune Lesioni Traumatiche della Colonna Vertebrale. Osservazioni del Dottor Gio. Melchiori. Genova. 1850.

Alcune Osservazioni di Fungo Maligno del Dottor Giovanni Melchiori. Milano. 1847.

Operazione del Fimosi Annotazioni del Dottor Gio. Melchiori. Genova. 1851.

Gazette des Hôpitaux. (We have just received, in one parcel, the first 12 numbers for the present year.)



J. Smith delt

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Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*On Dental Caries, and the Preservative Influence of the Saliva in that Disease.* By J. SMITH, M.D., 12, Dundas Street, Edinburgh.

IN most of those animal tissues which are in the living body exposed to the influence of external agents, there is to be observed a series of actions indicative of properties, by the operation of which a self-protecting power is manifested, whereby they are, in a great measure, enabled to preserve themselves from the effects of those mechanical and chemical forces which, acting from without, would otherwise lead to their destruction. I do not so much mean the power of assimilation and nutrition possessed by these structures, as of that action, by which a protective material is thrown out as a defence from external injury. Thus, in the skin and mucous membrane, this property is well exemplified in the increased development of epithelium, according to the necessity arising for its presence, as well as the increased flow of the secretion peculiar to mucous membranes, as occasion may render it serviceable. But in one instance, regarding which a few remarks are here proposed to be made, there appears to be no such self-protective property possessed as to enable the particular tissue in question to adapt itself to the action of external forces, although liable to be placed in circumstances at least as trying as either of these structures just mentioned. I allude to the teeth, where circumstances seem to necessitate the presence of a preservative agent acting in a different manner from the protective resources of other tissues, and not immediately connected with these organs; and where the existence of one agent, apparently in this capacity, seems to have been as yet unnoticed,—I mean the saliva.

The idea that the saliva constitutes this defence, suggests itself principally from the consideration of certain facts observed in connection with this secretion in the commencement and progress of dental caries, as well as from the alkaline and other qualities demonstrated by numerous chemical analyses. And the necessity for such a means of protection, appears to arise from the exceedingly feeble power of self-maintenance belonging to a tooth, and conse-

quent want of such means in itself as would be necessary for its preservation.

Besides the liability of these organs to mechanical injury, it must be observed, that, both by their structure and situation, they are exposed to the influence of chemical decomposition, and without the power of resisting the operation of this agency, or of repairing the injurious effect produced by it, become disorganised and broken down, exhibiting, as the result, that peculiar series of changes known as dental caries; but which, in reality, appears to be, not caries, but, in all probability, neither more nor less than chemical decomposition.

It will be recollected that three different tissues enter into the formation of a tooth:—the body of the tooth is composed of the substance termed *dentine*, which is, on the crown of the tooth, covered by *enamel*, and on the fang by *cementum*. All these structures differ in the amount of their organisation in different animals. In many cases these three tissues are seen to be mere modifications of one another; and the dentine, and even the enamel, in several instances, appears, like the cementum, to be a living substance; but in the human tooth, to which I shall restrict these remarks, the case is quite different, as the substance of the dentine, as well as the enamel, here appears, after its development is complete, to be destitute of all vital power, if not of all vitality. In these teeth, the dentine (Fig. 1, *d*), when examined microscopically, is seen to consist of a mass of minute tubes, radiating from the central or *pulp* cavity towards the whole surface of the tooth, and imbedded in a translucent homogeneous material, having in section somewhat the appearance of thin and transparent horn; while in the cavity of these tubes, and on their walls, is deposited the calcareous matter which imparts the characteristic whiteness and opacity to the substance of the tooth.

The enamel again (*e*) is composed of a solid mass of closely-packed crystalline and semi-transparent columns, appearing under the microscope of a yellowish-gray colour, and placed vertically to the surface of the subjacent dentine. The cementum (*c*) in structure very closely resembles bone, being laminated in formation, and provided with canals for blood-vessels, and with cells communicating with these and with each other by means of numerous canaliculi radiating from them in all directions. The cementum is endowed with a considerable share of vitality, as evidenced by the changes which take place in its bulk and character during exostosis and other pathological conditions of the fang.

In the human tooth, there appears to exist in the enamel and dentine, as a vital function, the power of development only; and that process being once completed, no means are left by which to maintain their condition in withstanding the changes to which they are subjected by the action of external influences. With their development, their vitality ceases.

Different views, however, have been from time to time advanced upon this subject; and at present very different opinions appear to be held regarding it, especially in so far as the dentine is concerned. There seems to be no question regarding the existence of vitality in the cementum; and it seems equally well established, that after its formation, which is very often defective, the enamel constitutes an inorganic substance, incapable of nutrition or growth, and devoid of all sensibility. These, then, may be passed over without further remark. But with regard to the dentine, the question becomes somewhat more difficult to decide, and has been the subject of much controversy. The facts brought forward in evidence of the vitality of this substance, are, its alleged vascularity and sensibility, and its being the seat of certain apparently vital actions during the progress of decay. The proofs of its vascularity are supposed to consist in the dentine becoming of a red colour, under the action of madder, given to an animal along with the food; and instances are even cited where it was alleged to become of a red colour, as the consequence of inflammation of its substance.

The madder, however, in these experiments was given during the period while the teeth were in progress of formation, and consequently when they would of course exhibit their vital functions in full activity, although, as before stated, these may become extinct with the completion of development; so that what are necessarily characteristics of this particular stage of their existence, by no means prove that the same qualities are to be found at a later period. Besides, these very experiments themselves go far to prove the reverse of the doctrine which they are intended to support, since Mr Hunter states, that such parts of the teeth as are formed before the animal takes the madder remain white; while only those which are formed while the animal is taking the madder will be found to be of a red colour.

And Mr Tomes states, that in his experiment only the pulp cavity, and cement,—the two structures allowed to possess vitality in the human tooth,—were coloured along with the rest of the skeleton. "But," he adds, "I could not discover that the colour extended further in the tubular than in the inner tubular tissue. Neither did the opaque line which marks the interior of the tubes, as seen by reflected light, seem coloured." Then as for the inflammatory redness of dentine, it goes too far to be held up as anything like a general example, since it would involve the existence, not only of vitality, but of a very high degree of vascular organisation indeed, before such an amount of blood could become collected in this tissue as to produce such marked effects.

In some instances, no doubt, traces of blood-vessels are found in the dentine of the human tooth; but these are merely abnormal modifications of the rudimentary condition of this structure, and are not to be appealed to as proofs of the continuance of this now extinct condition, but ought rather to be regarded as resulting from imperfect formation.

The sensibility imputed to the dentine, under certain circumstances, has never been satisfactorily demonstrated; nor can it well be so, for two reasons,—in the first place, because wherever caries has existed, this substance has been so much softened as in many cases to be quite elastic, and, in consequence, easily pressed down upon the sensitive pulp lying underneath; and when not so much softened as this, at all events its texture has become much more pervious to the entrance of fluid matters, &c.,—and thus, in both cases, without any absolute exposure of the pulp, pain may be excited in it, and in this way referred to the substance of the dentine. The immediate proximity of textures, such as the pulp and cementum, endowed as they are with sensation, renders the liability to this mistake very obvious; and indeed before any positive decision could be justly arrived at, determining the sensibility of the dentine, proof would be required that nervous fibres existed in the substance of this structure: the presence of such fibres, notwithstanding all the minute investigation to which the tissue has been subjected, has never been yet, in any way, recognised.

Regarding the "*consolidation of the living part of the dentine*," next to a portion attacked by caries, as spoken of by Mr Tomes (p. 203 of his work on Dental Surgery), it appears questionable whether this be a vital or merely a chemical and mechanical change. The more probable doctrine, however, is, that it consists of one, or a combination of both, of the two latter,—since a very similar, if not the same, appearance may be observed in the decay of the dentine of the hippopotamus' tusk, employed in the manufacture of artificial teeth, when these have been worn for some time in the mouth. Here in many cases three different results are visible as the effects of decomposition, and these, occurring simultaneously, give rise to appearances which I am inclined to believe identical with those occurring in the natural teeth.

Upon making a section across the substance of such an artificial set of teeth, which have been worn for some length of time, the appearances presented to the naked eye are those represented in Fig. 2 of the accompanying plate. First, we observe the discoloured and decomposed surface of the dentine forming the external layer, as represented at Fig. 2, *a*; next, and immediately within this again, a translucent band is observed, as at *b*; while within this again, and separating it from the healthy bone *d*, an opaque white band occurs, as seen at *c*. Now, upon submitting such a portion of dentine as this to microscopic examination, these appearances, viewed by transmitted light, are seen to consist in an apparently corroded condition of the whole interior aspect of the tubuli, which appear as if their walls had fallen in, and filled up the ordinary canal in them with detritus, rendering the structure at this point dark and opaque, as seen, Fig. 3, *a*;—while the translucent line seems to be only the result of a more advanced stage of this pro-

cess, and to consist in the removal by some means of the detritus mentioned just now, and consequently of the opacity. The broken-down calcareous substance previously contained in the tubuli being thus removed, they are left widened and empty, and, with the homogeneous translucent substance in which they lie, of course appear as a transparent zone betwixt the opaque band and the superficial layer, as is represented, Fig. 3, at *b*. The external surface of the bone again appears quite demolished, decomposition having gone on so far as utterly to destroy all structure, rendering the substance a dark-brown coloured mass, as shown in the drawing at *c*. The healthy substance is seen at *d*.

These sections were taken from different artificial sets, made from the hippopotamus' tusk, and were cut transversely from that portion of them corresponding in situation to the molar teeth.

Now, in the human tooth undergoing caries, as it is termed, there may be observed not only the translucent portion of the dentine, mentioned as arising from consolidation, but also, as in the other case, the opaque boundary between this and the healthy substance, although not so well defined in this instance, the texture of the human tooth being so much finer and denser in quality. If we place a section of a carious tooth under the microscope, there will be observed, first, as in the artificial sets, the completely disorganised crust forming the outer layer, as seen, Fig. 4, at *a*. Then the translucent line appears, as at *b*, intervening between the dark mass at *a*, and an irregular opaque band of dentine, as represented at *c*. The irregular form of these semi-transparent and opaque bands in the human tooth, when compared with those seen in the dentine of the hippopotamus, as well as their occasional absence altogether, may be accounted for, as before-mentioned, by the difference in the texture of the two structures; and not only this, but even in different parts of the same tooth belonging to the human subject, there is to be found a great variety in the degree of density, so that even in one tooth the opaque line may be visible in some places and not in others, as may be observed when examining a very thin section placed upon a black ground, so as to exhibit the opacity of the more dense portions, as seen, Fig. 5, where the opaque band is also seen surrounding the hollow produced by caries in the crown. Had this occurred more towards the fang, in all probability this appearance would have been here scarcely distinguishable from the opaque substance which is seen to exist in that situation.

Thus I so far agree with Mr Spence Bate, and those who consider the translucent line to result from the solution and removal of the calcareous contents of the tubes, and not from their solidification. However, I would go still further than them, and state that a change, preliminary to this stage of the process, is to be observed in the breaking down of the contents and walls of the dentinal tubuli, previous to the removal of the calcareous matter as debris, and the formation of the semi-transparent zone; which pro-

cess is the cause of the opaque barrier appearing to exist betwixt the carious and healthy parts of the tooth, as shown in the annexed drawing,—none of which appearances are any proof whatever of protective powers being possessed by these bodies. In this way, then, we find good grounds for believing that the process of decomposition, and subsequent removal of their component parts, occur in the same manner, both in the dentine worn as artificial substitute and in that entering into the formation of the natural human teeth, and that in neither case are those changes, either in their progress or arrestment, dependent upon, or connected with, inherent vitality in the substance attacked, but merely the result of chemical action.

These considerations, then, and the facts with regard to the vascularity and sensibility of the dentine, certainly appear at variance with the supposition, that the tissues liable to dental caries are capable of self-maintenance in any degree adequate to their subjection to disorganisation; and the existence of this apparent defect, taken in connection with several circumstances observable in relation to the influence which the *saliva* seems to exercise over dental decay, renders it very probable that this secretion has been substituted by nature for the supply of this deficiency, as a fluid suitable for the protection of those structures from the decomposing forces, whatever they may be, to which they are obviously so exposed.

That the saliva should constitute a preservative medium for the teeth, is a doctrine at complete variance with the opinion of many authorities upon the subject of dental caries; but that this secretion, in its normal state, so far from leading to their destruction, contributes by its peculiar qualities to their protection, appears an assertion capable of being supported by most convincing and decisive proofs. Most writers, indeed, who have adverted to this subject, have considered the salivary secretion as a source of dental decay only in those instances where it exists of abnormal quality, as in dyspepsia, &c., where it assumes an acid re-action, and will then at least assist the operation of those solvent matters, the action of which upon the substance of the teeth seems to be the cause of this disease. But Mr Spence Bate, in one of his lectures, published in the "Medical Gazette" for July 18, 1851, asserts that the saliva gives rise to caries from the presence in it of carbonic acid, derived from the products of respiration, and that, consequently, this acid renders it a destructive agent even in its normal condition.

Now, as that gentleman himself denies the necessity of any flaw in the enamel for the development of caries in any particular spot, it would certainly appear, if his theory hold good, that all teeth would be equally subject to decay,—but this we do not find to be the case; and, as for surmounting the difficulty by imputing the predisposing cause of caries to the facility with which the saliva

lodges in the natural crevices present in certain of the teeth, &c., how is the commencement of caries upon the smoothest surface of enamel explained, as when it attacks the external surface of the eye-teeth, where all that is presented for the action of any destructive agent is only a smooth cone of enamel? And how is the idea of the saliva being *detrimental* to the teeth, to be reconciled with the fact, that in those very situations where this secretion lodges in the greatest quantity, the teeth are there least affected with decay? as we find in the lower jaw, and especially among the front teeth of the lower jaw, where caries, in anything like the same extent we meet with in the upper jaw, is quite an exception to the general rule. Even in the dentine used for artificial teeth, the same course appears to be followed by the decay occurring there, as in the natural teeth,—since there is a tendency to much more rapid decay in the upper pieces all over, and in the back parts corresponding to the molar teeth of the lower ones.

Another circumstance seems greatly to militate against the theory that a destructive tendency of this kind should exist in the saliva,—since the constant presence of so powerful an agent in the immediate vicinity of the teeth, as could lead to such serious consequences, would be unparalleled by any other instance in the animal economy. We do not find any danger to the parts with which it is designed to come in contact from the secretion of the kidneys,—a fluid highly irritating to most tissues, even in its healthy state; neither do we find such results in any other similar case; and it is very improbable that, without any plausible reason whatever, the saliva should constitute the solitary exception to this very general, and in fact absolutely necessary, law. Even when diseased in quality, it is far more likely that this secretion, instead of taking any active share in the development of decay, should exert only a passive influence over the process of that affection, by its not being at such times of a nature calculated for the neutralization of destructive agents, altogether apart from, and independent of itself.

We might even go so far as to remark, that in those animals whose food is of a quality more apt to originate injurious effects upon their teeth, as in the herbivora, we find the salivary apparatus much more largely developed; and there is a possibility that this arrangement may, as well as for other purposes, be for affording additional protection to the teeth under these more disadvantageous circumstances. No doubt the prolonged process of mastication performed by these animals demands and produces a greater flow of saliva; but it is not in every case found that the amount of this secretion is in proportion to the duration of mastication,—since in old persons who have lost all their teeth, and, consequently, do not chew their food, the saliva continues to flow in quantity for some time after having taken a meal. The food is probably the main source of the agent which does produce decay of the teeth,

however that agent may vary under different circumstances; but it is unlikely that the saliva, even when its re-action may be acid, possesses any very great power in originating the disease, although in this state it may act, as mentioned before, as a passive agent in the progress of the disease. That in its healthy state it should constitute the means of injury to a set of organs whose destruction from their situation would be so inevitable, appears to be a conclusion we are quite unwarranted in adopting; and when we consider the deficiency of vital power in the great bulk of the tissues entering into the composition of a tooth, which would be necessary for enabling it to withstand the effects of the numerous deleterious influences to which these organs would be subjected but for the interposition of some means of defence, there appears to be a necessity for certain of the fluids of the mouth acting in this manner, and from the facts just mentioned as bearing so forcibly upon this subject, viz., the proportionately increased amount of decay occurring according to the diminished quantity of the saliva lodging in the neighbourhood, there seems to be little doubt that that secretion acts in this capacity.

I have advanced these few remarks upon this subject as one not altogether devoid of interest; and in doing so, the mere facts, as they are observed to occur during different conditions of the dental tissues, have been more my object than any attempt at explaining the cause of them, as this is a matter which would require more investigation than I have been enabled to make with regard to it. However, it is likely that the destructive agent does not consist in the alteration of any of the natural fluids of the mouth at all, but rather in some abnormal product, arising from different sources altogether, being added to them, the nature of which has not as yet been ascertained.

Nothing further can be positively said with regard to it at present; but in another paper I may perhaps be more prepared to enter into the discussion of this part of the subject, constituting as it does the most interesting question connected with the matter.

ARTICLE II.—*On the Function of the Spleen and other Lymphatic Glands as Secretors of the Blood.* By JOHN HUGHES BENNETT, M.D., F.R.S.E., Professor of the Institutes of Medicine, and of Clinical Medicine, in the University of Edinburgh.

(*Read to the Royal Society of Edinburgh, February* 2, 1852.)

IN a state of health, human blood, as is well known, contains a multitude of circular, biconcave, coloured discs, with which are usually mingled a few globular colourless cells. The relation of these bodies to each other, their origin, disappearance, and analogy with the oval blood cells of birds, reptiles, and fishes, are points which, al-

though they have excited lively discussion from the days of Malpighi up to the present time, are in no way determined. In 1845, I was fortunate enough to discover a peculiar condition in human blood, in which the colourless cells were greatly increased in number. This condition I have since ventured to call leucocythemia, or white cell blood; and a series of observations made on such blood during the last six years has enabled me to study its corpuscular elements under circumstances capable of throwing new light on their relations, mode of formation, and ultimate destination.[1] Thus leucocythemia has always been found associated with enlargement of the spleen, or of the lymphatic glands, and in one instance it was connected with enlargement of the thyroid body. Now these organs contain numerous colourless corpuscles, which are identical with those found in the blood, and it may readily be supposed that both have a common origin. Should this supposition be correct, the possibility of which has been maintained by some physiologists, but denied by others, it must necessarily lead not only to more correct information with regard to the mysterious functions of the spleen and other blood glands, but indicate, with greater precision, the true nature of the blood itself.

A correct theory of the development and growth of the blood corpuscles, and of the functions of the lymphatic glandular system, as it relates to them, can only be determined by discussing the following questions:—1st, What relation do the colourless and coloured corpuscles bear to each other? 2d, Where do they originate? 3d, What is their ultimate destination?

1. *Relation existing between the Colourless and Coloured Corpuscles.*

Many physiologists have maintained that the coloured corpuscles are formed from the colourless ones; and among those who hold this opinion, some have supposed that the latter bodies are directly transformed into the former (Paget);[2] whilst others contend, that, whilst such may be the case in fishes, reptiles, and birds, in mammals the coloured disc is merely the liberated nucleus of the colourless cell (Wharton Jones).[3] From the observations I have made on the blood corpuscles in cases of leucocythemia, the latter appears to me to be the correct opinion.

The mode of transformation of the nucleus of the colourless cell into the flattened, biconcave, coloured disc has not yet been described; but, from the appearances I have observed, it would seem to take place in the following manner:—The colourless cell may frequently be seen, on the addition of acetic acid, to have a single round nucleus. But more commonly the nucleus is divided into two, each half having a distinct depression, presenting a shadowed spot in its centre. Occasionally, before the division takes place, the

[1] See January, April, August, and October Numbers of the Journal, for 1851.
[2] Kirke's Physiology, pp. 68, 69.
[3] Lond. Phil. Trans., 1846.

nucleus becomes oval, and sometimes is elongated, more or less bent, and even of a horse-shoe form. Not unfrequently the nucleus is divided into three or four granules, each having the central shadowed spot. All the appearances here figured have been frequently observed, although I have placed them in the presumed order of development.

Fig. 1.

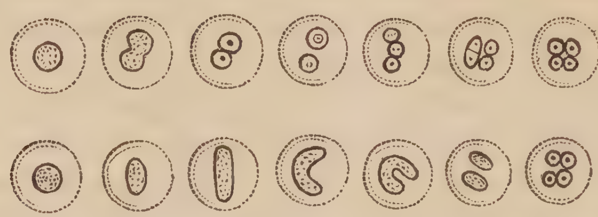


Fig. 1.—Colourless blood-cells observed in leucocythemia, showing the different appearances of the nucleus, placed in the presumed order of their development. 500 diam. lin.

On one occasion the colourless bodies in the blood were of two distinct sizes. The smaller were evidently free nuclei, such as could be observed within the larger.—(See Figs. 5 and 6, last October Number). On examining these latter, after the addition of acetic acid, all the appearances represented in the accompanying figure were observable, which I have again placed in the presumed order

Fig. 2.

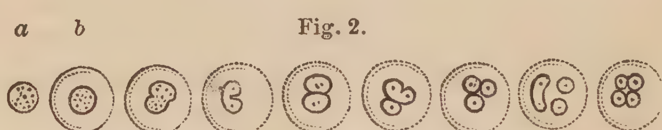


Fig. 2.—Development of the nucleus in colourless blood-cells, in another case of leucocythemia.

of development. On examining the lymphatic glands in this case, they were observed to contain the first body figured (*a*) in great numbers, associated with a few of the second one (*b*).

On several occasions the blood, when crowded with colourless corpuscles, was removed from the arm by venesection; and it was observed, that after standing twenty-four hours these variously shaped nuclei had become of a straw colour, and exactly resembled the coloured discs in tint. It was immediately apparent that they had imbibed the colouring matter of the blood, leaving the cell which surrounded them perfectly transparent. (See Fig. 8, in January Number 1851.)

With a view of still further determining the transitional changes in the colourless cells, I performed the following experiment:—A rabbit was killed, three hours after having eaten a meal. The thorax was rapidly opened, and a ligature placed round the pulmonary artery, to prevent the corpuscles coming from the thoracic duct passing into the lungs. The abdomen was then pressed gently for a few moments, to favour the flow of chyle, and then a ligature placed round the large vessels, and the heart removed by cutting above it. On examining the blood in the right ventricle, it presented an unusually large number of colourless cells, the nuclei of which, on the

addition of acetic acid, exhibited all the transition stages figured in the diagram. On examining the blood in the left ventricle, the colourless cells were normal in amount. This experiment was repeated with the same results.

I am therefore of opinion with Valentin, Wharton Jones, and others, that the coloured blood corpuscles in mammals are free nuclei. But I do not consider, with the latter observer, that these nuclei in mammals should necessarily proceed so far in development as to be surrounded with a cell wall,—in other words, the coloured disc is not always a further phase in the evolution of the colourless cell. On the contrary, I believe that the vast majority of the coloured blood discs simply reach the nuclear stage of growth before they join the circulation. Many of them, however, *do* proceed beyond this point in development, and may be seen to have cell walls around them. Under such circumstances, the nuclei increase endogenously by a process of fissiparous division, in the manner formerly described, circulate in the blood within colourless cells, and on the solution of the cell wall, also become coloured blood discs.

I have further examined the blood of birds, reptiles, and fishes, and have been enabled to observe transitional forms between the colourless and coloured cell, with even greater facility than I could in man. Indeed, the attention once directed to this point, scarcely a demonstration of blood can be made in these animals without seeing abundant evidence that the latter is a transformation from the former. In them, however, the colourless cell, at first round, enlarges gradually, becoming oval, and colour is added to it. Thus—

Fig. 3.

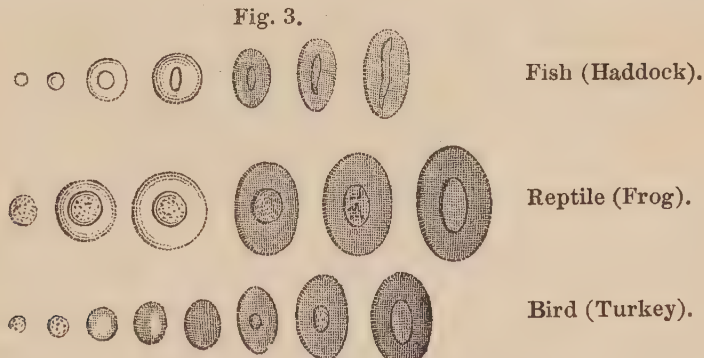


Fig. 3.—Cells of various sizes, colourless and coloured, observed in the blood of a haddock, frog, and turkey, placed in the order of their supposed development. 450 diam. lin.

The nuclei also, after the addition of acetic acid, may be observed in these animals to be undergoing fissiparous multiplication. Thus the following appearances may readily be seen :—

Fig. 4.

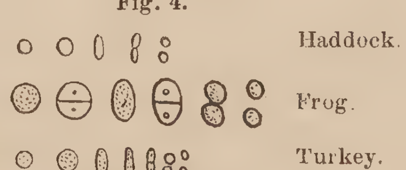


Fig. 4.—The nuclei of the blood-cells of the haddock, frog, and turkey, as seen after the addition of acetic acid.

Hence the same mode of endogenous development may take place in the blood cells of all the vertebrated tribes of animals, the difference being, that whilst in birds, reptiles, and fishes, the corpuscles retain the form of nucleated cells, in mammals we find the majority of them to be free nuclei.

2. *Origin of the Blood-Corpuscles.*

Hewson was the first who distinctly stated, that the blood-corpuscles were derived from the lymphatic glands, yet few have adopted his opinions. Even Cruickshank, who wrote on the lymphatic system immediately after him, and was one of his contemporaries, says of the lymphatic fluid in which these corpuscles swim, "that we do not know the use of this fluid."[1] The correctness of Hewson's views is not even clearly admitted by his recent commentator, Mr Gulliver,[2] has been denied by most physiologists in this country, and although Nasse, Wagner, Müller, and a few others, have contended that the lymph corpuscles in the blood are the same as those found in the lymphatic vessels, the mode of their origin and their functional importance is not even alluded to.

On examining the chyle in the lacteals ramifying below the serous coat of the intestine, it is found to consist of a multitude of minute fatty molecules, floating in a fluid. These diminish in number as the chyle progresses towards the thoracic duct, where it

a **Fig. 5.** *b*

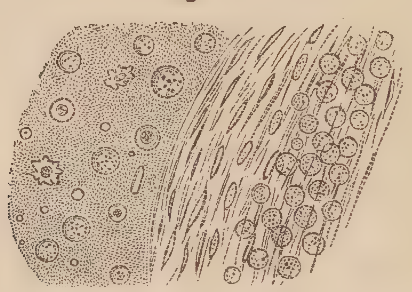


Fig. 5.—*a*, fluid; *b*, coagulated chyle, taken from the thoracic duct of a dog, three hours after being fed.

is found to contain a number of free nuclei, mingled with a few others which are surrounded by a delicate cell wall. The free nuclei may frequently be observed in mammals to present the same size and bi-concave discoid form of the coloured blood-corpuscles. (Fig. 5, *a*.) Moreover, on the addition of water, they in like manner become globular, and, after the fluid has been allowed to evaporate a little, assume a puckered or crenated appearance. They only differ in their want of colour, and in not being partially soluble on the addition of acetic acid. (Figs. 6 and 7.) On cutting into a well-formed lymphatic gland, and examining the juice

[1] The Anatomy of the Absorbing vessels of the Human Body. London, 4to, 1786. P. 73.

[2] The Works of William Hewson, F.R.S., edited by George Gulliver, F.R.S.L. Printed for the Sydenham Society. Note, p. 281.

which may be squeezed from it, it will be found to contain numerous free nuclei and nucleated cells. These are evidently the same

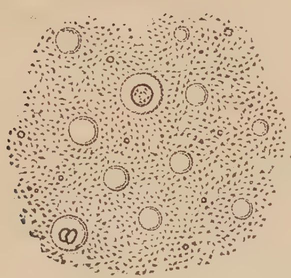


Fig. 6.

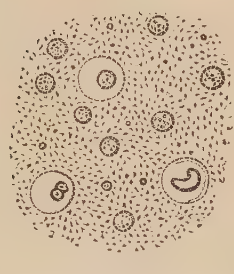


Fig. 7.

Fig. 6.—Fluid chyle, mingled with water, taken from the thoracic duct of a cat, three hours after it had been fed on milk.
Fig. 7.—The same, after the addition of acetic acid.

bodies as are found in the lymph and chyle, and the latter closely resemble the colourless cells of the blood. The nucleus of these corpuscles also may frequently be observed to have undergone the fissiparous division formerly described, and exhibit various stages of this process in chyle, taken from the thoracic duct. The opinion, therefore, held by many physiologists, that the colourless cells of the blood and those of chyle or lymph are the same, and consequently that in the highest class of animals they are not formed in the blood itself, but before they are mixed with that fluid, seems to be well founded.

According to Henle, the molecules of the chyle unite together in order to form the nuclei, which are afterwards surrounded by an envelope.[1] These, he thinks, are delayed, and become more fully developed in the lymphatic glands.[2] Nasse[3] also states, that he has seen aggregations of the chyle molecules and granular bodies, formed before they reach the lymphatic glands. On the other hand, it is certain that both nuclei and cells are most abundant in the glands themselves, and the cases of leucocythemia prove, that excess of colourless cells in the blood is not dependent upon an increase in the amount of chyle molecules, but is coincident with enlargement of the spleen and other glandular organs. It is to these, therefore, we must attribute the principal influence in the formation of the colourless cells, and to them evidently we must look for the origin of the blood-corpuscles.

Hewson considered the lymphatic glandular system to consist of the spleen, thymus, and lymphatic glands. He believed that particles were produced in these organs which ultimately became the blood-corpuscles, and that the spleen especially served to secrete the colouring matter which surrounded them. This doctrine, though supported to a greater or less extent by some German authors, has been repudiated by all British physiologists up to this time. Mr

[1] Anatomie Générale par Jourdain. Tom. i., p. 455.
[2] Ibid. Tom. ii., p. 103.
[3] Wagner's Handworterbuch. Arts., Chylus and Lymphe.

Simon[1] declares it to be impossible that the globules of the thymus can enter the lymphatic or blood-vessels, on account of the limitary membrane within which they are enclosed. But that they *do* find their way into those vessels was shown by Hewson and Sir Astley Cooper, who found them there; and that the colourless corpuscles of the spleen and lymphatic glands enter the blood in large numbers, is proved by what occurs in leucocythemia, and by the great preponderance of these bodies at all times in splenic and portal blood.

But there are other glands which must be associated with those just mentioned as part of the lymphatic system, such as the thyroid body and supra-renal corpuscles. The pituitary and pineal glands have also been referred to the same class of organs by Oesterlen.[2] Without entering into lengthy anatomical details of each, it may be said that all these organs resemble one another in the following particulars:—

1. They consist of a fibrous stroma, enclosing spaces lined by a structureless membrane, which spaces are filled with colourless molecules, nuclei, and cells, in all stages of development.

2. The corpuscles of all these glands resemble one another,—the nuclei corresponding in size to the coloured blood-discs of mammals, and the cells corresponding to the colourless corpuscles of the blood. The very slight differences which do exist are at once explained by variations in the degree of development.

3. They have no excretory ducts, so that if the corpuscles formed in them are to leave the organs in which they originate, it can only be by the lymphatics or veins.

Now, it is certain that the blood of the splenic and portal veins, even in health, is always richer in colourless corpuscles than that of the systemic circulation.[3] It is also well known that in young animals the blood contains a larger number of these bodies than it does in their adult condition,—that is, when all these glands, including the thymus, thyroid, and supra-renal capsules, are fully developed and in a state of activity. In leucocythemia, we observe that when these glands are hypertrophied, and their corpuscular elements are multiplied, that the colourless corpuscles of the blood are increased in number. Two very carefully made observations, however, appear to me sufficient in themselves to determine the connection of these lymphatic glands with the cells of the blood. Thus in one case, where the thyroid body was enlarged, its cells and their included nuclei were considerably smaller than usual, and it was ascertained that the colourless bodies in the blood and their nuclei were smaller also. (Figs. 1, 2, and 3, in October Number 1851.) In another case it was seen that the colourless corpuscles in the blood were of

[1] On the Thymus Gland. P. 91.

[2] Beiträge zur Physiologie des gesunden und kranken Organismus. Jena. 1843.

[3] This well known fact has lately been confirmed by the careful observations of Funke.—*Henle's Zeitschrift,* 1851, p. 172.

two distinct sizes, the smaller corresponding with the nuclei of the larger ones, and the lymphatic glands were found to be crowded with corpuscles also of two distinct sizes, exactly corresponding to those in the blood. (Figs. 5 and 6, in October Number 1851.) From these facts, we can have little doubt that the colourless corpuscles are formed in the lymphatic glands, and from thence find their way into the blood.

By what channel they effect this, whether by the lymphatics, the veins, or by both, it is very difficult to determine. The limitary membrane which surrounds the sacular glands is exceedingly delicate; indeed so much so, that its existence has been denied by some observers. When distended, therefore, it may easily break, and the contents be poured into the pulp, surrounding stroma, or blood-vessels. Dr Sanders[1] has lately shown that the Malpighian sacs of the spleen are traversed by very large vessels. But it must be acknowledged, that notwithstanding the certainty which exists as to the connection between the closed lymphatic glands and the blood-vessels, and the passage of corpuscles from one to the other, the method by which this is accomplished has not yet been demonstrated. I cannot help thinking, however, that there must be a direct venous communication.

Of late years physiologists have been in the habit of calling these glands the blood-glands, although nothing more definite has been determined with regard to them than that they are in some way subservient to nutrition, especially during an early period of life. But if I have been successful in establishing, that the corpuscular elements found in these organs are transformed into those of the blood, it will follow that the lymphatic glands secrete the blood-corpuscles in the same manner as the testes secrete the spermatozoa, the mammæ the globules of the milk, or the salivary and gastric glands the cells of the saliva and gastric juice.

With regard to the exact mode in which the corpuscles are formed in the glands, two theories exist, both of which are dependent upon numerous facts and observations closely connected with the origin of all vital structures, and indeed of organization itself. One is, that these are thrown off, in the form of epithelium, from the membrane which surrounds them; the other, that they originate in an organic fluid, by the production of molecules, the successive development and aggregation of which constitute the higher formations. I have long been of opinion, that the latter theory is the more consistent with known facts, and certainly all that I have seen during repeated investigations into the structure of the various lymphatic glands, is in harmony with it. Nowhere have I seen the nuclei and cells of these glands attached to, or apparently given off from, a membrane, still less from supposed fixed germs—but everywhere pervading a molecular fluid within the closed sacs. But however produced, whether from molecules or fixed germs, it is here they are formed, and are

[1] Report of Physiological Society of Edinburgh, for January 31st, 1852.

subsequently thrown into the torrent of the circulation,—there, colour is added to them, and they become blood corpuscles. Multitudes of free nuclei, in this way, join the blood, and are at once converted into coloured blood discs.[1] The cells circulate for a time as colourless corpuscles, but after a certain period their walls dissolve, when their included nuclei also become coloured discs. In the three inferior vertebrate tribes, the entire cell becomes oval, and assumes colour.

All that is known of the development of the blood corpuscles, on the one hand, and of the blood glands on the other, supports the theory now brought forward. The primitive production of blood in the embryo, occurs in the interior of cells in the vascular layer of the germinal membrane, which cells are afterwards transformed into vessels. At this period the colourless cells are very abundant, and their nuclei may be seen to undergo the fissiparous mode of multiplication formerly described; the cells themselves also in this fœtal condition, multiply by division.[2] In the invertebrate tribes, there are no lymphatic vessels or glands. In fact there is only one circulation, which has been shown by Milne Edwards to consist of a series of tubes, analogous to arteries or veins, which communicate by means of lacunæ that surround viscera. But the circulating fluid contains two distinct kinds of corpuscles, which Mr Wharton Jones has shown to be different phases of each other, and to correspond with the colourless and coloured corpuscles of fishes, reptiles, and birds.[3] In fishes a lymphatic system exists separately, and in them we first observe a

[1] In making this statement, I am aware of the possibility of these nuclei being surrounded by a cell wall, so fine as not to be detected by the best instruments. But having confirmed the observations made originally with Oberhaeuser's instrument, by means of an excellent lens by Ross, of one-eighth of an inch focus, with the most careful attention to the management of the light, it is my conviction that the great majority of these bodies possess no cell walls.

[2] These changes are well figured by Fahrner.—*De Globulorum Sanguinis*, &c. Turici, 1845.

[3] Henle seems to think that there are certain analogues to lymphatic glands in this class of animals, for he observes:—"In certain invertebrate animals the vessels which are bathed by the liquids contained in the cavities of the body, present appendices like a *cul-de-sac*, which open into these vessels, by which we are enabled without trouble to inject and distend them with air. These appendices may be compared to those of the lymphatics on the surface of the intestines which run into the villi, and draw from the intestinal cavity a liquid, which they immediately transmit to the plexus of lymphatic vessels. I have found the most simple appendices of this kind on the vessels of the mantle in the gelatinous ascidians (*phallusia*), where they are prominent on the surface of the animal's body like other villi. Stannius has seen the trunk of the ventral vessel of the arenicola furnished with a multitude of villi, generally long, terminating in *cul-de-sacs*, and frequently full of red blood. We have long known on the branchial veins of the cephalopoda, appendices of this kind, true glands, filled with a whitish secretion. Each of these communicate by several openings with the cavity of the veins."—*Anatomie Générale, par Jourdain*, tom. 2, pp. 587-8. Should this view of the extension of a lymphatic system to certain invertebrata subsequently prove to be correct, it will serve to explain many of the facts pointed out by Wharton Jones,—especially the occurrence of a discoid and occasionally a coloured nucleus in the blood of some of these animals.

pituitary body, supra-renal capsules, and a spleen. In reptiles there are added the thymus and thyroid glands, and in both these classes of animals the communications between the blood vessels and lymphatics are numerous and direct. In birds we first observe, in addition, glands on the lymphatics of the neck, but not on the lacteals, and there are two thoracic ducts. In the mammalia, the highest development of the lymphatic glandular system exists, including mesenteric and lymphatic glands, a spleen, thymus, thyroid, pineal, and pituitary bodies, and supra-renal capsules. Thus, we observe a correspondence between the amount of corpuscular elements in the blood, and the extent and complexity of the lymphatic glandular system. They are comparatively few and colourless in most of the invertebrata, and in such animals, as stated by Wagner, should be considered as analogous to those of lymph. They become more numerous and coloured, with the appearance of a spleen and supra-renal capsules, in fishes. Both in fishes and reptiles, however, the colourless cells are numerous. In birds the coloured cells are smaller, but still nucleated; and in mammals the coloured bodies are free nuclei, and are even much more abundant.

Another fact of great importance was pointed out to me by my former assistant, Mr Drummond, viz.,—that the numerous nuclei found in the spleen, varied in size in different animals, but always corresponded with the nuclei of the blood corpuscles. This statement I have confirmed in man and various mammals, in the frog, and in the newt. In the latter animal, the spleen corpuscles, like the nuclei of the blood, are unusually large.

With regard to the development of the lymphatic glands, it has been pointed out by Mr Goodsir,[1] that the thymus, thyroid, and supra-renal capsules originate from a mass of blastema at the upper part, and in front of the Wolfian bodies, in the embryo of sheep, and he has traced and described the mode in which this mass is transformed into the three organs. It is very possible that the spleen is developed either from the same, or from a neighbouring mass. Engel[2] has lately traced the development of the lymphatic glands, from the lymphatic vessels in sheep, first by a process of fissiparous division, and then by the formation of a cell which is subsequently converted into a contorted and multiple tube forming the gland. These points in embryology have yet to be confirmed and extended; but so far as they go, they offer additional arguments in favour of the theory I am advocating. It has been imagined, for instance, that the blood cannot be derived from chyle and lymph, because, in the embryo, the first is formed before the two latter fluids. It must be evident, however, that the formation of blood and lymph in the embryo resembles what occurs in the invertebrata, in which both fluids are formed together.

[1] Lond. Phil. Trans., 1846. [2] Präg. Vierteljahrschrift.

Again, it has been supposed that the coloured cannot be formed from the colourless bodies of the chyle,—1st, because the former can been seen of all sizes in the blood itself; 2d, because, on examining the blood of fœtal animals, no intermediate stages of growth can be seen between them; and, 3d, because, on the addition of acetic acid, while the coloured bodies are nearly dissolved, the naked nuclei of the chyle are not. Hence it is said they are of different chemical composition.

With regard to the first argument, derived from variations in size of the coloured particles, it may be said that, granting the fact, nuclei may also be observed both free and within cells, of all sizes, so that they correspond perfectly with the coloured corpuscles of the blood. Besides, in different cases of leucocythemia, although the colourless cells have been seen to be smaller, of the same size, somewhat larger, and even twice as large as the coloured bodies, their nuclei may always be observed to correspond exactly with the different phases of the latter. With regard to the second argument, advanced by those who have not succeeded in detecting transition forms in embryonal blood, I am persuaded that this arises from the circumstance, that attention is directed to the colourless cells, instead of to their nuclei. For my own part, I have never failed to observe all the changes previously described, not only in fœtal, but even in adult blood. As to the third objection, in reference to dissimilarity of chemical composition, it must be remembered that when the chyle corpuscles enter the circulation by the left jugular or subclavian vein, they pass immediately through the pulmonary artery into the lungs, come in contact with oxygen, and undergo chemical changes, with which we are as yet unacquainted. Some physiologists have supposed that colour is added to them before they join the pulmonary circulation, because yellow corpuscles have been seen in the upper extremity of the thoracic duct. In all such observations, however, they have been necessarily exposed to the atmosphere; and I have frequently confirmed the observation of Emmert, viz., that the coagulum of chyle, at first colourless, becomes pinkish-red in contact with air. On this point I offer no opinion, believing that neither chemistry nor physiology has as yet communicated to us any exact information with regard to the when or how hæmatin is produced. But whatever the changes may be which occur in the lymph corpuscles on their passage into the lungs, to them we must attribute their altered chemical constitution, as observed colourless and insoluble in the lymphatic glands and in chyle, and partially soluble in the torrent of the circulation.

3. *Ultimate destination of the Blood Corpuscles.*

There may frequently be observed in the spleen of all animals, groups of blood-corpuscles, surrounded by an albuminous deposit closely resembling a cell wall. This fact has been differently interpreted. Gerlach is of opinion that they are new blood corpuscles

forming within a mother cell,[1]—whilst Kölliker[2] and Ecker[3] maintain that they are old ones, which, having fulfilled their functions in the

Fig. 8.

Fig. 8.—Cells with single and multiple nuclei, many of which latter in colour and form exactly resemble blood-globules. From the human spleen.

circulation, go to the spleen, and are there dissolved. These large cells, containing several coloured nuclei, I believe to be cells of the lymphatic glands, which, under especial circumstances, assume power of increased development, with endogenous multiplication of nuclei. They are common not only in the spleen, but in the mesenteric and other lymphatic glands, especially when hypertrophied from neighbouring irritation, the result of inflammatory or cancerous exudations, and especially in typhoid fever. A similar increased power of development may occasionally be observed in the epithelial cells of the pulmonary air vesicles in certain pneumonias; in those covering the choroid plexus in hydrocephalus; in those of the epidermis in epithelial cancer; and in pus. On the other hand, that extravasated blood-corpuscles may assemble together in groups, and subsequently be surrounded by an albuminous deposit closely resembling a cell wall, is a fact of great pathological importance. It is true they closely resemble the lymph cells, with multiplying nuclei, but may, I think, be separated from them by possessing more colour. I have seen them not only in the spleen, but in other glands, and especially in the brain, following spon-

Fig. 9.

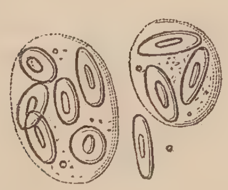


Fig. 10.

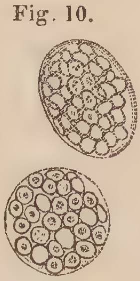


Fig. 9.—Groups of coloured blood-corpuscles, surrounded by a transparent albuminous layer from the brain of a pigeon, which had been punctured three days previously.

Fig. 10.—Groups of blood-corpuscles, surrounded by a similar layer, from an apoplectic extravasation in the human brain.

taneous and artificial sanguineous extravasations. But surely it will not be maintained, that the normal function of the organs, in which

[1] Handbuch der Allgemeine und Speciellen Gewebelehre, &c., s. 53.
[2] Mikroskopische Anatomie, &c. 2 Band, s. 282.
[3] Wagner's Handwörterbuch. Art., Blukgefässdrüsen.

these accidental formations occur, is to dissolve the blood-corpuscles. Besides, from the numerous facts which have been referred to, I trust it has been made apparent, that the spleen is much more probably a blood-forming than a blood-destroying gland.

The view which seems to me most consistent with facts is, that the blood-corpuscles are dissolved, and with the effete matter absorbed from the tissues by the lymphatics, constitute blood fibrin.

Fibrin has generally been supposed to be the most important element of the liquor sanguinis, and necessary for the evolution of the tissues. This idea was attacked by Zimmermann,[1] who endeavoured to show that it was the result of the metamorphosis of the textures, and constituted so far effete matter. The arguments which support this view seem to me unanswerable. Thus there is no fibrin in the chyme, and very little in the chyle; and there is less in the chyle and blood of carnivora than of herbivora. Hence fibrin cannot be a result of the primary digestion. In the egg there is no fibrin, although organisation is proceeding rapidly in it. Again, the blood of the fœtus possesses no fibrin (Jennings, quoted by Zimmermann), and that of the newly born infant very little. Nasse found it to contain its normal quantity at four years of age. These facts are sufficient to prove that fibrin is in no way necessary to cell development and formation of the tissues. On the other hand, all those circumstances that cause exhaustion of the textures, or increase the amount of absorption from these, augment the amount of fibrin, as after inflammatory or other exudations, starvation, violent fatigue, pregnancy, and frequent bleeding or hemorrhage. Both Nasse and Zimmermann found it far more abundant in lymphatic, weak persons, than in those who are strong and vigorous. Again, while there is little fibrin in the chyle, it exists in great quantity in the lymph of the lymphatics, as determined by Nasse in man, and Müller in frogs.[2] It follows that the primary digestion must transform fibrin into albumen, rather than the latter into the former; and such is very probably also the result of the secondary digestion. How otherwise could so small a quantity, as from one and a half to three parts in a thousand, exist in healthy blood—an amount altogether disproportionate to what would be required, did this constituent build up the tissues as such? We observe, however, that increase of fibrin is generally accompanied by proportionate decrease in the corpuscles. Thus, in the blood of robust persons there is excess of corpuscles, but little fibrin; whereas, in weakly, phthisical, or chlorotic individuals, the globules are diminished, and the fibrin increased.[3] It appears, therefore, probable that the fibrin results partly from a solution of blood corpuscles, and partly from the effete matters of the tissues. Hence why absorption of exudations, or of the textures from exhausting causes, will pro-

[1] Zur Analysis und Synthesis des pseudoplastischen Processe. Berlin, 1844.
[2] Ibid, p. 19.
[3] Ibid, p. 16.

duce increase of this constituent in the blood, as well as an increase in the disintegrating process of the blood corpuscles themselves. In leucocythemia an increased number of colourless cells are thrown into the blood, and fewer free nuclei. The former, consequently, float as colourless corpuscles in the circulation. Solution of cell walls must be effected to a greater extent than occurs in health, and hence we find the fibrin increased.

It has been maintained by some that fibrine is secreted by the blood corpuscles. Dr Carpenter supposed this to be the especial function of the colourless cells,[1] and Mr Wharton Jones of the coloured nuclei.[2] But there are facts proving that fibrin must have a double origin as I have stated, one in the solution of both kinds of corpuscles, another from the tissues, of which its increase during inflammation and in rheumatism are examples, although in these morbid states, increase in the colourless or coloured corpuscles is certainly not essential. Hence fibrin must be referred to a process of disintegration, rather than to one of evolution,—but even in this capacity, may serve to produce higher elaboration of that complex fluid, the blood.

From the various facts which have been stated, I think we may conclude :—

1. That the blood corpuscles of vertebrate animals are originally formed in the lymphatic glandular system, and that the great majority of them, on joining the circulation, become coloured in a manner that is as yet unexplained. Hence the blood may be considered as a secretion from the lymphatic glands, although in the higher animals that secretion only becomes fully formed after it has received colour by exposure to oxygen in the lungs.

2. That, in mammalia, the lymphatic glandular system is composed of the spleen, thymus, thyroid, supra-renal, pituitary, pineal, and lymphatic glands.

3. That, in fishes, reptiles, and birds, the coloured blood-corpuscles are nucleated cells, originating in these glands; but that, in mammals, they are free nuclei, sometimes derived as such from the glands; at others, developed within colourless cells.

4. That, in certain hypertrophies of the lymphatic glands, their cell elements are multiplied to an unusual extent, and under such circumstances find their way into the blood, and constitute an increase in the number of its colourless cells. This is leucocythemia.

5. That the solution of the blood corpuscles, conjoined with the effete matter derived from the secondary digestion of the tissues, which is not converted into albumen, constitutes blood fibrin.

[1] British and Foreign Medical Review, vol. xv., pp. 272, 273.
[2] Ibid, vol. xiv., p. 597.

ARTICLE III.—*On the Evidence of Apoplectic Death, and of Death by Smothering, in Persons found Dead, with Notice of a Case of Death under Suspicious Circumstances.* By WILLIAM SELLER, M.D., F.R.S.E., Fellow of the Royal College of Physicians of Edinburgh, &c.

(*Read before the Medico-Chirurgical Society of Edinburgh, February* 4, 1852.)

A TRIAL lately took place before the High Court of Justiciary, in which a man, who was charged with the murder of his wife, was acquitted, owing to the insufficiency of the medical evidence. The accused and his wife were much addicted to drinking. They had been drinking in a public-house one Saturday evening, and went home together, where, after some time, they were as usual overheard by their neighbours to be quarrelling and abusing each other. Early on Sunday morning the man was seen loitering in the neighbouring streets, as was his custom. In the course of that day he was repeatedly seen to enter and come out of his house. About eight o'clock in the evening he went to a house not far distant, and announced his belief that his wife was dead. Several persons went with him, and found the woman not only dead, but cold and stiff, as if she had been dead for a considerable time. Two medical men saw the body in less than half an hour, in the same attitude in which it was found. The following are extracts from the medical report drawn up by them :—

"We found the body lying in bed, partly covered with bedclothes; her wearing apparel not removed, with the exception of her cap ; the face was slightly swollen, and bloody froth was issuing from the mouth. On the right cheek a small abrasion was observed, and there was a streak of blood running over the same cheek towards the ear; the eyelids were slightly tumified; the conjunctivæ a little injected; the pupils dilated, and the cornea dimmed or milky ; the nostrils were livid ; the tongue was not protruded, and around the mouth were observed three livid lines, one of them extended from the right nostril past the right angle of the mouth, and the other two were placed between the right side of the mouth and chin. Under the chin was found a very distinct blue mark, about the size of a sixpenny piece, with abrasion of the skin. No mark of any kind was observed on the neck; but on the chest were seen five abrasions, each about three-quarters of an inch in length, and nearly one-quarter of an inch in breadth."

The post-mortem examination was made the next morning. The body was found in the same attitude in which it had been left as described in the next extract from the report.

"It was lying on the back, inclining towards the left side; and the joints were rigid, as we had found them on our former examination. The left thigh was flexed on the pelvis, and the knee bent. The right thigh was rotated inwards; the knee bent, and resting

on the calf of the left leg. On removing the wearing apparel previous to examining the body internally, there was found on the shift a large quantity of feculent matter, and on the upper part of it several spots of blood. On the right shin there was an abrasion four inches long and half an inch broad. About the middle of the thigh, and anteriorly, there was a similar but deeper abrasion, about two inches in length and half an inch in breadth, both injuries having evidently been produced by a force moving from above downwards.

"On examining the head, no unnatural appearance was observed externally; but on removing the skull-cap, the sinuses were found distended with blood; and anteriorly, the pia mater was of a pinky hue, being also more than usually vascular throughout. Over the hemispheres, there were numerous old adhesions of the arachnoid, and around them it was of a milky hue. Internally, the brain presented numerous red points. The lateral ventricles contained each about a drachm of serum, and the vessels of the choroid plexus were turgid.

"In the chest, the viscera and great vessels were found healthy; but within the right and left cavities of the heart was found a considerable quantity of dark blood partially coagulated.

"The abdominal viscera were all in a normal state, with the exception of the spleen, which was softened.

"The uterus was found larger than a fœtal head, and scirrhous;

"On opening the spinal canal, the only abnormal appearance observed was slight injection of the vessels.

"Although the above appearances, and the absence of anything to account for death by natural causes, appear to warrant us in coming to the conclusion, that death was caused by violence; yet we hesitate to give a decided opinion."

On the examination of these gentlemen before the Court, one stated, that, from the appearance and aspect of the body, death might have been caused either by violence or by apoplexy, or by both; but he could not positively say that it must have been caused by violence or suffocation. The other said it was impossible that death could have been caused without violence, although natural causes might have combined to this end.[1] To the questions put to them by the Court, whether they could say, as men of skill, that there was any one mark found on dissection which indicated that the death had taken place by suffocation, and not by apoplexy? they did not answer in a decisive manner.

The general evidence was all of a circumstantial kind. None of the neighbours had seen or heard anything of the deceased from late on the Saturday evening till the time when she was found dead; the prisoner's house consisted of but one apartment; the bed was a box-bed opposite to the window; the bed shut in with doors,

[1] Caledonian Mercury, Thursday, 25th December 1851.

which were open when the dead body was first seen; the room was sufficiently light; the deceased's face was towards the front of the bed, so as to be readily seen; there was no cap on the head; the accused had often said he would be hanged on account of his wife, and she also was in the habit of predicting the same thing; there was a fire in the grate; the woman's death took place early in September, when the weather was tolerably warm.

The declaration of the prisoner bore, that he had gone to bed with his wife on Saturday night about midnight; that he had gone out early on Sunday morning, and loitered about the neighbouring streets; that about eight o'clock he had seen his wife pass in the direction of home, and that on going there soon after, he found her lying on the floor, as he believed, in a state of intoxication; that he spoke to her on this occasion, and that she answered him; that he immediately went out to get a light, and on his return found his wife had lain down in the bed; that he went out soon after, and returned again to cook his dinner, having been several times in the house between that period and eight o'clock in the evening; that, on all these occasions, he remained in the belief that his wife was sleeping; but, at this latter hour, on proceeding to lie down in bed, that he found his wife cold, when he immediately went and called his neighbours. This account was not in any respect confirmed. None of the neighbours had seen his wife, or heard her stirring out on the Sunday morning, and it did not appear that she had visited any of the adjacent public-houses. It was understood, however, that had the defence been entered on, one witness would have been produced to say he had seen her at a distance in the street that morning; but he neither spoke to her nor saw her face, and judged only by her dress, which was of a description common in the place.

On the conclusion of the medical evidence, the case was given up by the Crown; and the Court consequently directed the jury to return a verdict of not guilty, as the only appropriate verdict, when the charge was withdrawn.

It is not necessary for our present purpose to assume that the accused in this trial was guilty. The case may be reasoned on as one of a class in which the medical evidence, from the post-mortem examination, being chiefly of a negative character, is only of avail, when the general evidence, with or without the aid of medical interpretation, comes near to satisfactory proof. When the general evidence falls under this description, it is undeniable that even merely negative medical evidence may be sufficient to supply all that is necessary to establish the true character of the case. If there be cases of homicide, as is very certain, in which medical evidence is not at all necessary to a conviction, surely there must also be cases where a small amount of such evidence may suffice.

Positive medical evidence doubtless is, on every occasion where it is attainable, much preferable to negative; but if medical evi-

dence be had recourse to in all cases to which it is even remotely applicable, it should be listened to and received under the varying conditions of certainty to which, from its essential nature, it is subject. Sometimes it amounts to demonstrative, more frequently it coincides in character with moral evidence, and runs through gradations corresponding to possibility, probability, and moral certainty. The highest medical skill, backed by all attainable medical knowledge, cannot make medical facts, and the reasonings founded on them, go further than their essential nature permits. All that can be required in a medical witness is, that he shall know his profession, not that he shall be able to make medical science bend to the solution of every doubt in regard to health, disease, and death, that can arise in the ever varying proceedings of courts of law, civil or criminal.

As respects the cause of death in persons found dead, it fortunately happens that in the largest number of cases positive evidence of a satisfactory kind, as to the mode of death, appears on dissection. And the very strength of this evidence, on most occasions, may possibly be one reason why the negative evidence, which, in a smaller number of cases, is all that can be attained, is apt to be so much slighted. The paramount weight of the medical evidence towards the determination of guilt in cases of homicide by violence, or by the ordinary poisons, leads to an undue expectation of the same certainty in all other cases in which the suspicion of crime has arisen. The two classes of cases to which these observations apply, require respectively, on the part of the prosecution, a totally different mode of proof; in the one class, the medical evidence establishes unequivocally the fact, that death has taken place otherwise than by natural causes, what remains being to determine the kind of agency by which this death has occurred ; in the other class, the general evidence must be brought to bear concurrently with the medical evidence, as well on the question, whether the death did, or did not, happen by natural causes ? as on the ulterior question, by what agency it was effected ?

If our courts will listen to nothing but the same positive medical evidence, from the post-mortem examination, in cases, for example, of smothering, as is so uniformly furnished in cases of homicide by wounds, blows, or poisoning, it may be anticipated that the criminal administration of the country will long continue to lie under the reproach, that a man may smother his drunken wife with impunity.

All the evidence not falling under the head of general evidence, which can be expected in a case of smothering, is the absence in the post-mortem examination of anything denoting death by a natural cause, and on some occasions the exact description of suspicious marks about the mouth. The indefiniteness of the internal morbid appearances in cases of unequivocal smothering was fully exempli-

fied by Dr Christison, in his remarks on the case of Margery Campbell, one of Burke's victims. In that case, sufficiently proved otherwise than by the medical evidence, to be a case of murder by compression of the chest, and closure of the mouth and nostrils, the lungs, it may be remembered, were entirely free from congestion, and the parts within the head quite healthy, with the exception of a little more turgescence of the vessels than usual. The medical report in her case bore, that, under all the circumstances ascertained, it appeared *probable* that the woman had died by violence. The striking resemblance between the case of Margery Campbell, and that which has given rise to these remarks, cannot fail to be perceived, especially when reference is made to the conclusion of the medical report already cited. In all the essential points, the medical evidence was as strong in the case before us as in that of Burke's victim.

In the first place, I wish to draw the attention of the Society to the important question,—Whether medical evidence of this negative character really does, or does not, contribute anything to the solution of the difficulty which such cases present? I should certainly answer in the affirmative.

The alternative is, that the deceased in such a case died a natural death. Had a person, who was seen walking on the streets ten or twelve hours before he was found dead, died a natural death, it is not easy to say how many thousand chances it is to one that the post-mortem examination would not establish the natural death as a matter of certainty. Sudden death is a comparatively rare occurrence, and of this rare occurrence the rarest form is that in which dissection shows no trace of its nature. Thus the medical evidence in such a case, while it indicates a possibility of the death being natural, reduces its probability within a very narrow limit. It would be absurd to contend that an accused party should be convicted on a capital charge, merely by a calculation of chances in regard to the likelihood of one event however remote. But the improbability of the death being natural, can be held as one element only in the train of evidence. And surely it is an element of as much weight as those which ordinarily enter into the train of general circumstantial evidence. If there be a prejudice against circumstantial evidence, how ill-founded is it? It would be easy to show that it is the least deceptive of all kinds of evidence, provided the number of particulars which enter into it be large, and the links between them be complete throughout. But what is the nature of the argument in evidence of a circumstantial kind? What else but an affirmation of high improbability; the opposite conclusion can never be described as impossible, but only as beyond all measure improbable. To throw sixes with the dice a hundred times running cannot be pronounced to be impossible; yet every one is satisfied to conclude, that whoever does this does it by contrivance, and not by chance. In a chain of circumstantial evidence quite satisfactory, for

the conviction of a party accused of a crime, each of the links by itself is necessarily compatible with his innocence, as affording only probability of guilt. And therefore such medical evidence as indicates no more than a probability that death was not natural, may properly enter into such a chain when in other respects free from all reasonable doubt. It is well declared, that a prisoner on trial is to enjoy the benefit of a doubt if it arises ; but that maxim has reference to the doubt which may arise after the consideration of the whole chain of circumstantial proof ; and certainly not in regard to the defect of absolute certainty which may respect any one of its links. There are but few points of medical evidence that do not admit of some degree of doubt ; for example, if the woman concerned in the case before us had lived in a town under siege, and her head had been seen to be struck off by a cannon ball, as she walked in the street adjacent to her house, who could affirm beyond doubt that the cannon ball was the cause of death, and that, before it took effect, she had not died by a sudden stroke of apoplexy ; but under doubts like these the course of human affairs would come to a stand.

Among the particulars of the general evidence in the case before us, there are some which merit consideration, with a view to determine how far they might have been made more available by a stricter medical scrutiny and interpretation. And here, for the sake of convenience, all the appearances in the dead body, except those discovered by dissection, are placed among the points of general evidence, since some of them were spoken to by others besides the medical witnesses.

The intemperate habits of the deceased gave rise to difficulties at every step in the investigation of the nature of the case. Still it seems impossible to conclude that the numerous distinct abrasions on the surface of the body were the mere effect of falls, and not of violence inflicted. The livid marks also beneath the chin and near the mouth can hardly be set down for accidental, particularly as the medical witnesses gave in evidence, that when the thumb was placed on the livid mark under the chin, and the mouth compressed, by a finger placed on each side of the nose, the livid lines near the mouth corresponded to the depressions between the folds so produced. It is to be regretted, however, that these marks were not cut into to discover the reality and extent of extravasation.

To the redness of the eyes in a woman of intemperate habits much importance cannot be attached ; yet it is a mark to which Dr Christison properly gave much weight in Margery Campbell's case. In the absence of any large number of distinctly recorded cases of smothering, it is perhaps allowable to refer to instances of death by excessive pressure in a dense crowd of people, where the death appears usually to take place by suffocation consequent on the compression of the chest. As might be expected, the body after this kind of death shows marks of the violent excitement of the circulation which must attend the commencement of the strug-

gle. Nevertheless, there is good reason to think that the appearances, though more prominent in degree, are of the same character as when the mouth and nostrils are simply covered, and the chest compressed by the weight of a homicide's body. In Margery Campbell the conjunctivæ were much injected with blood. In twenty-three persons suffocated in a crowd in the Champ de Mars at Paris, on the 14th June 1837, during the rejoicings for the marriage of the late Duke of Orleans, nine showed an infiltration of blood under the ocular conjunctiva, which was raised, so the reporter says, as in chemosis; while the eyes in all the rest exhibited a highly injected state of both the ocular and palpebral conjunctiva with numerous minute points of ecchymosis.

It would have been desirable that the attitude in which the body was found had been more fully detailed, particularly as respects the upper extremities, and the degree of elevation of the head.

From the general evidence, it appears that the body was cold and stiff when first seen by the neighbours, so that they judged at once that the deceased had been dead for some time. It is a matter for regret that the medical report does not more particularly refer to the exact degree of coldness and stiffness at the time when the medical men first saw the body. In their evidence, however, before the court, they stated their belief that the deceased had been dead for about sixteen hours.

Here, then, is a most important point—one, indeed, on which the whole case may be said to turn. If it was quite certain that the deceased, at nine o'clock in the evening, had been dead at least sixteen hours, then there is a pointed contradiction of the statement in the declaration of the accused, that his wife was out in the streets at eight or nine o'clock in the morning, and that he saw her alive after that period on the floor of his house; and, sometime after, that he found that she had gone into bed. Sixteen hours previous to nine o'clock in the evening carries the supposed time of her death back to five o'clock in the morning, so that were this belief of the medical witnesses established, the guilt of the accused might reasonably be inferred.

It does not appear in the medical report, nor did it appear in the evidence given before the court, how far the medical witnesses had given the requisite attention to the degree in which the body had cooled and become stiff, to enable them to justify, to the satisfaction of other medical men, their statement as to the long period which had elapsed between the woman's death and the discovery of the body.

Had they been able to state, as they perhaps could, that they had examined every part of the body, and had found no remains of heat, not even on its under surface, where it rested on the bed, the deceased being neither far advanced in life nor emaciated, under the other circumstances spoken to,—namely, the warmth of the season, the closeness of the apartment, with a fire in the grate, the body being covered both with the day dress and the bed-clothes, it

would have been fair to pronounce that the deceased could not have been cut off by apoplexy, or indeed by any other kind of sudden natural death so late as ten or eleven o'clock on the Sunday morning, or even an hour or two earlier.

In apoplectic death, as well as in most other kinds of sudden death, the body, it is well known, cools, and the limbs stiffen with unusual slowness. It must be a familiar observation to medical men, that not unfrequently, on proceeding to open a body from twenty-four to forty-eight hours after death, the remains of heat are frequently detected when the hand is thrust under the back, with the purpose of turning or raising the body. Since this trial occurred, Dr Alfred Taylor has published, in the "Edinburgh Medical and Surgical Journal," some observations on the time required, under different circumstances, for the cooling of the dead body, in connection with a case of homicide by strangulation. The case referred to is that of a young woman in a state of pregnancy, found dead, with a cord around her neck, thirteen hours after the strangulation had been accomplished. She had been all this time in the open air, near the middle of October, when the lowest temperature of the night in the neighbourhood was 37·5° of Fahrenheit. The head, arms, and legs were cold, and the latter rigid, but the body, that is, the abdomen, was warm. Here the temperature was such as to render the cooling of the body more rapid than in the average of cases. On the other hand, the youth of the deceased, and the state of pregnancy, were circumstances to a considerable extent favourable to the preservation of heat. Dr Taylor estimates the average time for the cooling of the dead body of an adult, when exposed to the ordinary cool atmosphere of a room (at a temperature of about 60°), the body not being much covered with clothing, at about fifteen or sixteen hours. He adds, however, what is quite certain, that warmth is often much longer retained; and states a case of suffocation by charcoal vapour, investigated by himself, in which, twelve hours after death, the body was warm all over, the legs still preserving their warmth. This person was found dead in a bed-room, in January, in which there had been no fire, and the body had been loosely covered with bed-clothes.

When one reflects how important the time of the death was in the trial now under review, as to the guilt or innocence of the accused, it seems impossible to conceive that a jury could have come to a just decision, from the consideration of the period required for the cooling of the body, without the aid of medical assessors, as suggested by Dr Christison in his lecture before the College of Physicians,[1]—that is, of independent medical witnesses, who should state their opinion after listening to all the facts detailed by the other witnesses, general and medical.

The objection, that these medical men would thus usurp the func-

[1] Monthly Journal of Medical Science, November 1851.

tions of the jury refutes itself, if it be admitted that the jury is not competent of itself, or even with the assistance of the judge, to reach the conclusion which they derive from the medical assessors. There is no compulsion on the jury to adopt the opinion of these assessors any more than to obey the direction of the judge. The opinion of the assessors, that such and such statements, of which, by hypothesis, they alone are competent judges, are established, or not established, by the witnesses, is merely one feature in the body of evidence which the jury are entitled to give effect to, or not, in their verdict, as they may think fit. The alternative is, on the one hand, that pieces of evidence on which the character of the whole case, in nice and difficult trials, like that before us, shall be altogether cast aside; or, on the other hand, that the same be misinterpreted; and, nevertheless, no provision is thereby made against the risk of the opinion of a medical witness who may speak confidently without knowledge, guiding the jury, as much as the deliberate judgment of men who have earned a reputation, by years of application to the very points on which that judgment is founded.

Of the appearances described in the medical report as found on dissection, I must confine myself to those observed within the head. I will only first remark, that in a person so much addicted to drinking as the deceased, it would have been desirable that all ground for affirming that the case was one of actual poisoning by alcohol had been removed, by a more particular reference to the state of the stomach and its contents, if not by the chemical search for indications of alcohol in the brain. For if the suspicion of actual poisoning were thus set aside, the condition of the body when found was sufficient to disprove the idea that death had taken place by any of those accidents by which intoxicated persons are not unfrequently cut off.

The appearances found within the head indicate chronic disease of the membranes of the brain, such as is often met with in drunkards, but afford no foundation for a belief that the death was apoplectic.

When the importance of the relations of apoplectic death to so many questions arising in forensic medicine is considered, there is cause for surprise that a history of apoplexy, under this special aspect, should be rarely met with. By writers on general medicine, the term apoplexy is used with far too great latitude, to convey any distinct idea to counsel, judges, and juries, of its special bearing on the cases which occur in our courts of law. By the ordinary use of the word as nearly synonymous with the generic term coma, they are naturally led to believe, that the so-called simple or congestive apoplexy, and the so-called serous apoplexy, stand on the same footing with respect to frequency and reality as hemorrhage of the brain—which is plainly the proper type and normal form of apoplexy.

The slight significance of congestion of the substance of the brain, or of serous effusion in the ventricles, as compared to the

presence of an actual extravasation of blood, in questions of the kind before us, will become evident at once by putting these several cases in the following form. Let us suppose that in three several instances there is no history of the symptoms which preceded death, and that the head is opened in each, with a view to verify the cause of death. In the first let us say a congestion of the substance of the brain is the only appearance within the head. It will be admitted by medical authorities, that this appearance throws very little light on the nature of the disease by which life was terminated,—such a fullness of the vessels of the substance of the brain appears to be present in about three-fourths of all cases of death; and, if the estimate be confined to the sudden deaths of persons in previous health, in a far larger proportion. In the second instance let us say that two or three ounces of serous fluid are found in the ventricles, with or without congestion of the substance of the brain,—with no other evidence than this, no one surely would venture to say, that life had been cut off suddenly under apoplectic symptoms? But, in the third instance, let us suppose that two ounces of blood are found, in the ventricles or somewhere else, effused within the brain; and, without any other evidence, it can be pronounced, with hardly a shadow of doubt, apart from marks of violence, that the deceased must have died apoplectic soon after the attack.

To look a little more narrowly into the three instances here supposed,—if it be undeniable that congestion of the brain is present in three-fourths of all kinds of death, and in a much higher proportion of all kinds of sudden death, surely far too much importance has been ascribed to this congestion, in the absence of other information, as indicating the occurrence of apoplectic death? Congestion of the brain is not, in truth, a sufficient cause of death, unless when it approaches to what has been termed capillary apoplexy. Some degree of red punctuation of the cerebral substance is seldom absent in the substance of the brain,—and when no distinct cause of death is discovered by dissection, it is too common to magnify the ordinary slight red punctuation of the brain into a case of cerebral congestion. The whole subject requires re-investigation, and rules are necessary, particularly for those not much conversant with the opening of bodies, to determine what degree of red punctuation is entitled to the name of cerebral congestion.

We have only to open the works of our pathological authorities almost at random to discover how little the recorded cases come up to the standard required clearly to prove congestion of the brain a real form of apoplexy. Andral gives five cases to prove that death may take place by apoplexy without any actual extravasation of blood. Looking to these cases, I think it would have been more correct to say, that coma may precede death without any actual extravasation. His first case is one of long-continued disease of the heart, in which insensibility preceded death by about twelve

hours. There was found on dissection great congestion of the lungs; and the congestion in the brain was such as to bring the case almost within the description of capillary apoplexy. In his second case, there was extensive disease of the thorax and abdomen; the substance of the brain is described as being injected with blood. The patient became, indeed, comatose forty-eight hours before death; but there was little of the characteristic form of apoplexy in the coma. In his third case, there was extensive disease of the chest and abdomen, and there was extensive congestion of the brain. The patient had been subject to attacks of giddiness for many years; sudden hemiplegia came on, with loss of consciousness at first, there was then insensibility, and after some days death followed. A question might arise, if there was not here chronic disease of the spinal cord? His fourth case is one of far advanced phthisis; in the head was found a bright red injection of the cerebral substance; it is probable that this state of the brain arose from atrophy of its substance. His fifth case is also one of phthisis; dissection showed red points in the cerebral substance; previous to death there was febrile delirium. Thus in all these cases there was present an adequate cause, or adequate causes, of death, independently of the congestion of the cerebral substance, so that that congestion was not necessarily the cause of death, but only of the head-symptoms which attended the last moments of life.

Dr Abercrombie's cases of simple apoplexy—four in number—have hardly any better title to rank as genuine cases of apoplexy; and most probably a microscopic examination, or a reference to the state of the kidney, would have thrown light on their real nature.

One feature in all such cases is important, as respects forensic medicine,—namely, that though they may retain the name of apoplexy, they are hardly followed by immediate death; and perhaps it may be affirmed that what the French term "apoplexie foudroyante," or that in which death is like a thunder stroke, is never the result of congestion of the brain, when that term is properly restricted. As bearing on the true signification of cerebral congestion, I quote Rokitansky's account of the slightest form of capillary apoplexy. "Sometimes a spot of grey or white cerebral substance, varying in extent, is speckled or striped with a small number of dark red dots and streaks of extravasated blood, or ecchymoses; the streaks run parallel to the nervous fibre, the intermediate cerebral substance preserves its normal colour and consistence, and when the fibres of the brain run in one direction, it seems to the naked eye merely drawn asunder, some few only of the elementary parts having suffered an actual solution of continuity."—*Pathological Anatomy*, vol. iii., p. 386.

As respects the so-called serous apoplexy, it is easy to show how little title it has to be considered a genuine form of apoplexy. Dr Abercrombie, along with other modern authorities, regard the effusion of serum, not as the cause of the apoplectic symptoms,—coma

is the more correct word,—but as the result of that state of the vessels on which the coma depends; and this is equivalent to declaring that there is no such disease as serous apoplexy.

Serous effusion, as is well known, attends death in many chronic diseases,—it is a common accompaniment of what is termed death by the head; but the characters of what is termed death by the head in chronic diseases are very different from the distinct form of apoplexy. Moreover, nothing is more certain than that a considerable quantity of serous effusion may exist within the head for a long period before death, without giving rise to any symptom approaching to those of apoplexy.

Even when symptoms of an apoplectic kind precede death, without being of the distinct and sudden character which mark genuine apoplectic seizure, there would be little inconvenience in denying to them the name of apoplexy, and referring them to the head of coma, along with the loss of sensibility, so common in states of fever. The apoplexia venenata, of which the most striking example is that consequent on granular disease of the kidney, would be better termed coma than apoplexy. That a sudden death is not from this cause will be apparent, if the kidney be free from disease, and urea be not discoverable in the brain.

Apoplexy, then, as was before remarked, is essentially the hemorrhage of the brain,—it is a disease which varies in degree, but in which there is no room for a distinction of species. The attempt to form species of apoplexy has given rise to much confusion of ideas. This has arisen from not preserving a clear conception of the distinction between the nosological and proper pathological forms of disease. The nosological characters of apoplexy are loss of sense and motion, while the pulse and respiration remain distinct, with signs in general of paralytic affection of one side; the pathological character of apoplexy is hemorrhage of the brain. If simple and serous apoplexy be represented as separate forms of the same disease, then they are separate pathological forms, not separate nosological species; and unless it be admitted that there is some known variation of the outward symptoms corresponding to vascular distension and effusion of serum, there can be no variety of nosological species. The mere variation in the strength of the pulse and the temperature of the surface are not sufficient grounds of nosological distinction.

In a medico-legal point of view, apoplexy may be described in some such terms as the following:—A sudden attack, marked by a more or less complete loss of sense and motion, the pulse and breathing remaining distinct, the mouth being most commonly drawn to one side, with other signs of hemiplegia; when fatal, the death rarely instantaneous, sometimes within three or four hours; most frequently not for one, two, three, or many days; after death extravasated blood found within the head, the quantity great for

the most part in proportion to the suddenness of the death; the heat of surface continuing long after death, and sometimes greater for a short time after than before death; the extremities not soon becoming rigid.

As respects the connection of the symptoms with the internal hemorrhage, I quote the following passage from Rochoux's work, one of the first in this century, in which an attempt was made to give exactness to the subject by reference of the symptoms to morbid anatomy. "The greater or less quantity of hemorrhage determines the symptoms to be more or less severe, and constitutes the several degrees of the disease: thus a small extravasation will occasion a stupor, which may not go so far as a loss of consciousness, may produce dimness of sight, imperfect motion of the tongue, or a marked and continued weakness of one side of the body; while a more considerable extravasation shall produce a complete loss of consciousness, with hemiplegia; and one still greater shall cause the patient to fall into a comatose state, quickly ending in death. This is what happens in those struck dead by apoplexy—(*dans les apoplexies foudroyantes*). It is as easy to explain and to conceive the connection between the symptoms of the disease and the cause on which they depend, as it is to say that, owing to the quantity of blood extravasated and the lesion of the brain never perhaps being absolutely equal in each hemisphere, there is almost always palsy on one side of the body, even though the extravasation be double."—*Rochoux's Recherches sur l'Apoplexie*, p. 87. It may be said, that though the limitation of apoplexy in this manner to distinct hemorrhage of the brain may be conducive to a greater distinctness in the use of the term, yet that it does not remove the difficulty presented in medico-legal inquiries by the possibility which may always exist, that a person found dead, without the effusion of blood in his brain, may have been cut off by some of those forms of disease which have been conjoined with genuine apoplexy.

On this head all that the present state of our knowledge permits us to say is, that if a person, who has been seen alive and well at a period before death no longer than suffices for the cooling of the body when that has been found cold and stiff, and the post-mortem examination reveals nothing but congestion of the cerebral substance, or slight serous effusion, he should not be pronounced to have died by sudden apoplexy. Thus the only attainable diagnosis between a case of death by smothering and a death by spurious apoplexy is, that a longer period of time must elapse after the person has been seen alive and well in the case of spurious apoplexy than in the case of smothering before the body becomes cold and stiff. And it will strongly add to the improbability of the person having been cut off by spurious apoplexy, if there be urine in the bladder which is not coagulable by heat, if there be no marks of granular disease in the kidney, if urea be not discernible in the

brain, if there be no traces of alcohol there; and lastly, if the microscope show no signs of organic alteration in the cerebral substance.

Edinburgh, 4th February 1852.

ARTICLE IV.—*Fatal Case of Poisoning with Oxalic Acid.* By ALEXANDER WOOD, M.D., F.R.C.P., Lecturer on Practice of Medicine: *With a Chemical Examination.* By GEORGE WILSON, M.D., F.R.S., Lecturer on Chemistry.

ALTHOUGH cases of poisoning by oxalic acid are by no means unfrequent, and although the subject has been thoroughly investigated by Professor Christison, and Dr Coindet of Geneva, yet, as each individual case which occurs may serve to elicit facts of importance, I make no apology for publishing the details of a case which recently occurred in my own practice, and in which a very considerable quantity of the poison would appear to have been swallowed.

As certain very unfounded suspicions were conveyed in anonymous letters to the authorities regarding this case, I was directed to give in a report of it to the Procurator-Fiscal; and this report, with scarcely any alterations, forms the substance of the following narrative.

On the evening of the 19th May 1851, between half-past nine and ten o'clock, I received a hasty call to a house where I have attended professionally for many years. I was informed that one of the servants had taken a fit (although some suspicion seemed to be entertained that it was only pretended), and I therefore lost no time in obeying the summons.

On my arrival, I found the nursery-maid, M—— W——, a stout young woman, lying on the top of the bed, in the nursery, on her right side, her face turned to the wall, her knees drawn up on the abdomen, her right arm slightly extended in a semiflexed position, her clothes on. She was evidently quite dead. Placing my hand on the abdomen I ascertained the existence of pregnancy; and, judging from the size that the period of gestation was not far from being accomplished, I listened with the stethescope to ascertain whether the fœtal heart still pulsated, but the infant was, as far as I could judge, also dead.

I was informed that almost immediately before I was sent for, she had been seized with vomiting and inability to speak; and having been lifted into bed by two of her fellow-servants, was laid in the position in which I found her. Having now obtained the attendance of Dr Seller, the following facts were noted with his kind assistance.

At the foot of the bed stood a chair, the carpet on front of which

was covered with a greenish-black matter, reported to have been ejected by vomiting. This was collected in a phial, and sealed up, and labelled No V.

On the table beside the window was a saucer, containing a small quantity of crushed sugar ; a child's tin, partly full of water ; and a china sugar basin, containing a crystalline mass, the crystals being distinctly acicular, and having an intensely acid taste. The bottom of the basin was covered with this solid slightly humid residuum, apparently to some depth ; and, from the fact of the whole of the internal surface of the basin above the mass being covered with fine crystals, it might be inferred, that it had at one time been nearly full of a solution of the same crystalline substance. This basin was sealed up, and labelled No. I.

The trunk of the deceased contained her clothes neatly folded and packed. On the top of these lay a small parcel, made up and sealed, as is done in apothecaries' shops. This contained some rolled sulphur ; a rope for fastening the trunk lay by its side. On the top of a chest of drawers lay a clean shift, bed-gown, night-cap, and white cotton stockings, which, on the supposition that she intended to commit suicide, were probably put in readiness to dress her body. The deceased had on a walking dress, and her bonnet was lying on the table. The front of her black dress, its lining, and the cloth of her boots, were covered with deep red stains, apparently from the matter which she had vomited. From one of her fellow-servants, a remarkably intelligent girl, the following facts were elicited :—

M—— W—— returned herself 27 years of age at the last census, had been eighteen months in her present place, which she had voluntarily given up, and was to have left on the day on which she died. She told informant that she was neither going home, nor to another place, nor to be married, and she did not appear to be acting as if she were really going to leave her present situation, as she had sent no porter for her trunk, nor done what was usual under such circumstances. About four o'clock this afternoon she went out, saying she would be back in an hour, but did not return until seven, when she seemed well and cheerful. For a moment she appeared annoyed at meeting in the kitchen the woman who was to take her place. This, however, soon passed off, and at their request she took tea with her and her fellow-servant, and seemed in good spirits, talking cheerfully. After tea, she went out for about twenty minutes, and returned with a small apothecaries' parcel, round which was carelessly wrapped a piece of newspaper (sealed and labelled No. II.). With this she went into the nursery, and in a few minutes came into the kitchen with her bonnet off, and having the newspaper crushed together in her hand ; she threw it down on the dresser. She then returned to the nursery, and was heard to go from it twice to a closet in the lobby close to the nursery door, where crockery, tea, sugar, and other necessaries are kept. She

again went to the kitchen, and surprised the servants by desiring them to get ready to wash the next day, and advised one of them to go to the grocer's for soda before the shop was shut. On the return of this girl from the grocer's, she found the deceased had taken the two youngest children, of whom she was very fond, from bed, and had them with her in the nursery. The other servant then took away one child; the other was left with deceased in the nursery.

Soon afterwards, on passing through the lobby, she heard a noise like vomiting, and entering the nursery, she saw the deceased sitting on a chair at the foot of the bed vomiting severely. Deceased made a sign to her to hold her head, but seemed unable to speak. She was asked if she would like a drink, she shook her head, and imperfectly muttered "No." She then made signs that she would like her clothes unloosed. This was scarcely accomplished, when she fell on the floor, and appeared stupid. The other two women then lifted her on the bed; she seemed partly roused, and tried to second their efforts.

She then became quite insensible, when I was sent for.

On examining the closet in the lobby, this servant immediately missed a cup, a child's tin, and a bowl, all of which she had seen in their places shortly before. On being shown the bowl, containing the crystalline mass, she immediately identified it as the one which should have been in the closet, and stated further, that it had been used at tea that night, and that after tea she herself had washed it and put it in its place.

She always thought the deceased a light-hearted merry girl; she had one male acquaintance, who visited her for some time regularly once a week, but for the last three months he had not come near her. Deceased told our informant that he had offered her marriage, but that she had refused him. Had noticed the change in her shape, but had not remarked upon it to her.

Post-mortem Examination, thirty-five hours after Death.—The post-mortem examination was performed by Mr Struthers, in the presence of Dr Seller and Dr Jefferiss, of Dalkeith, who attended at the request of the friends of the deceased, and myself.

External Surface and General Appearance natural; the lips, especially at the angles, were covered with minute acicular crystals; some frothy liquid issued from the mouth.

Digestive Organs.—The tongue, pharynx, and œsophagus presented a remarkable bleached appearance, the œsophagus especially had a bluish leaden-gray colour, easily removed with the handle of the scalpel. The stomach presented a large irregular aperture on its upper and anterior aspect, nearer the cardia than the pylorus. From this opening a dark gelatinous-looking matter, resembling coffee grounds, escaped in abundance on handling the stomach. Some of this was collected in a bottle (No. III.). The aperture in the stomach seemed at first to be of a size sufficient to admit the

point of the finger. On handling it, it tore of a larger size, and eventually presented the appearance of two large openings separated by a narrow band.

The internal surface of the stomach was occupied by the same grumous-looking fluid; and the mucous membrane presented an eroded appearance.

The jejunum and ileum presented changes of a similar character. Portions of these viscera were preserved for chemical examination. (No. IV.).

The Uterus was pregnant, and rose about three inches above the umbilicus. The vagina was considerably dilated. The peritoneal surface of the uterus and small intestines was much injected.

Organs of Respiration and Circulation.—The larynx was filled with frothy mucus. The heart and lungs were healthy; left side of the heart and lungs were gorged throughout with blood.

Chemical Analysis by Dr G. Wilson.

The substances which I received for examination were,—

1. A crystalline mass contained in a bowl.
2. A piece of torn newspaper, said to have been wrapped round the parcel, with which the deceased returned home shortly before her death.
3. A portion of the contents of the stomach, removed after death.
4. Portions of the stomach and intestines.
5. Substance alleged to have been vomited, taken from the carpet.
6. A pair of boots taken from the body of the deceased.

The crystalline mass (1) consisted of long, narrow, semitransparent, irregular, six-sided white prisms, without odour, but possessed of a sharp sour taste, and reddening litmus powerfully. Heated on platina, they fused, and then volatilised, yielding a white irritating vapour, and leaving a slight residue of dark-coloured ash.

Warmed in a test-tube with oil of vitriol, they evolved a blue-flamed gas (carbonic oxide) and carbonic acid. Boiled with water, they entirely dissolved, yielding a very sour liquid, which, even in small quantity, powerfully reddened infusion of litmus.

This solution acted as follows with re-agents:—

a. Sulphureted hydrogen, along with hydrochloric acid, gave no precipitate.

b. Hydrosulphuret of ammonia gave no precipitate.

c. Carbonate of potass gave no precipitate.

d. Nitrate of baryta (preceded by ammonia) gave a white precipitate, soluble in nitric acid.

e. Nitrate of silver, after neutralisation of the liquid with ammonia, gave a white precipitate, soluble in ammonia and in nitric acid.

f. Sulphuric acid and alcohol determined no green colour in the latter when kindled (absence of boracic acid).

g. Sulphate of lime gave a white precipitate, insoluble in acetic acid, and convertible by a red heat into carbonate of lime, soluble in this acid, with effervescence.

These tests fully demonstrated that the crystals consisted of nearly pure oxalic acid; and to avoid repetition, the letters under which each test is noted, will only be referred to in the further statements.

The portion of newspaper had traces of a white powder adhering to it, and when cut in pieces, and boiled with water, yielded a weak acid solution, answering to the liquid tests already given.

The contents of the stomach (3) formed a dark brown, gelatinous, semi-solid mass, which strongly reddened litmus paper. They were digested in cold distilled water, and the liquid filtered, and treated in succession with the tests applied to the aqueous solution of the crystals. The action of the tests was the same as with the dissolved crystals, except that the acidulated nitrate of silver (*e*) gave a slight white precipitate due to the presence of chlorides.

The vomited matter (5) resembled generally the contents of the stomach, but was paler in colour. It reddened litmus powerfully; and when digested with cold distilled water, yielded, after filtration, a pale red liquid, which became of a faint purple when ammonia was added, probably in consequence of the presence of colouring matter derived from the carpet from which it had been removed. The liquid otherwise acted with all the tests exactly as that from the contents of the stomach had done.

The portions of stomach and intestine (4) were not examined.

The boots (6) were of black cloth with leather fronts. The cloth was stained with dark yellow spots, closely resembling those occasioned by nitric acid, but darker. Unlike these, however, they were entirely removed, and the original colour of the cloth was restored by the action of ammonia.[1]

Remarks.—The large quantity of solid oxalic acid found near the deceased, and the direct and weighty character of the accessory evidence, left little to be done by chemical analysis.

The contents of the stomach required no other treatment than digestion with water to render them amenable to examination. Cold water was taken to avoid the solution of gelatinous and

[1] Several pieces of black broad cloth were not altered by the action of oxalic acid on them; but the cloth of the boots was stained by sprinkling solution of oxalic acid on it, exactly as it had been by the liquid (believed to have been oxalic acid ejected) which had fallen on them. Some black cloths are first dyed with woad or indigo, and are not reddened by acids. Boot cloth is of inferior quality, and is not subjected to a preliminary treatment with the blue dyes; so that I find specimens stained from a respectable boot-maker are readily stained by oxalic acid. This acid, indeed, supplies a means of distinguishing the more costly broad cloths, on which it has no action, from the cheaper ones, which it quickly spots.

other animal matter, which would have resulted from the employment of a hot solvent.

I need not point out that the proof of oxalic acid having been administered to the deceased is superabundant. The only question that can be raised is,—Was it the only poison taken? From the negative action, however, of the liquid tests *a*, *b*, *c*, it may be inferred that none of the poisonous compounds of the heavy metals had been taken; and from the action of the other tests, *d*, *e*, *f*, *g*, that no acid had been taken, except possibly nitric acid, which none of the tests exclude, and which, from the stains on the boots, might have been suspected to be the cause of death. The disappearance, however, of the stains, instead of their browning when wetted with ammonia, would remove the suspicion of nitric acid.

Moreover, on treating the liquid obtained from the stomach (3), or the vomited matter (5), with sulphate of indigo, the latter was not bleached, whether taken alone or mixed with pure sulphuric acid.

G. W.

24 Brown Square, May 1851.

The perusal of the foregoing narrative, and especially the complete examination by Dr Wilson of the various matters transmitted to him, can leave no doubt whatever that the unfortunate woman died from a poisonous dose of oxalic acid; and it seems nearly equally clear, that the poison was voluntarily swallowed with the intention of self-destruction. At one time she had been accustomed to earn her living by cleaning straw bonnets, for which oxalic acid and sulphur are largely used. This probably suggested the poison which she selected, and the roll sulphur found in her trunk had probably been bought along with it to lull suspicion. There was no label on the parcel, nor could a careful examination by the authorities discover the shop in which it had been purchased.

It is not easy to estimate the quantity which was swallowed. The probability is, that the solution which was swallowed was not only concentrated, but contained a large quantity of the acid in suspension, and undissolved. The rapidity with which death ensued is one characteristic of the effects of this poison.

The symptoms, and the appearances after death, were all highly characteristic of the effects of oxalic acid. Indeed, the only peculiarity would appear to be the perforation of the stomach which was found on the post-mortem examination. "Oxalic acid," observes Dr Taylor, "does not appear to have a strong corrosive action on the stomach, like that possessed by the mineral acids. It is therefore rare to hear of the coats of the organ being perforated by it."

Indeed, the result of several experiments made by him on portions of the jejunum of a young infant, led him to doubt "whether the contact of the acid with the adult stomach after death would

lead to perforation of the organ." Dr Taylor refers especially to one of a series of cases recorded by Dr Geoghegan, in which "the contents, including no inconsiderable amount of acid, remained in contact with the coats of the organ, and yet no perforation was observed." Dr Christison mentions only one case in which the stomach was found perforated. "Orfila and Galtier do not mention," says Dr Taylor, "a single case." He quotes, however, from the "London Medical Gazette" (xxxv., 47) a case recorded by Dr Letheby, where, after death, "at the cardiac end the coats of the stomach were of a pulpy and gelatinous consistency, and presented numerous perforations." The foregoing case, then, adds to the records of poisoning an unequivocal instance of the occurrence of this very rare result.

19, Royal Circus, 3d February 1852.

Part Third.

CLINICAL REPORTS, LECTURES, ETC.

CLINICAL MEDICINE.—PROFESSOR BENNETT.

REPORT OF THE CASES OF FEVER TREATED IN THE CLINICAL WARDS OF THE ROYAL INFIRMARY DURING THE WINTER SESSION 1851-2.

INTERMITTENT FEVER.

Tertian Intermittent cured by Quinine.

Case 1.—John Kelly, a labourer, admitted into the clinical ward, October 20th, 1851. Has always enjoyed good health until three months ago, when he was attacked with intermittent fever in Lincolnshire, while working at the harvest. At first it assumed the quotidian type, but after three weeks it became tertian, and continued three weeks longer. Then being at Morpeth, there was an interval of a fortnight. On leaving Morpeth he was much exposed to cold and wet; the disease returned, and has continued up to the present time. The day after admission, he had a well-marked attack of fever. The cold stage continued fifteen minutes, and the hot and sweating stages three quarters of an hour, followed by langour and depression. He was ordered to take five grains of sulphate of quinine three times a-day, and a scruple of the drug two hours before the next expected paroxysm. He had two other attacks on the 24th and 26th, the latter being very slight. On the 28th there was no attack, and the scruple dose was suspended. Discharged cured November 5th.

Case 2.—James Law, a labourer, æt. 22, was admitted into the clinical ward, November 3d, 1851. Six weeks ago, when working at the harvest in Lincolnshire, was seized with tertian intermittent. He has taken quinine, but the

disease has always returned on discontinuing the medicine, and he has become weak and unable to work. Says that he has had an attack every 24 hours for the last four days. After admission no attack appeared, but he was weak, pale, and complained of feeling of cold in the back every alternate day. November 8th, he was ordered three grains of quinine three times a-day, when he rapidly gained strength, and his general appearance underwent a marked change for the better. Dismissed cured November 24th.

Commentary.—The cause of intermittent fever is tolerably well ascertained. It is found in all countries which are low, swampy, and humid, and in localities where the ground is marshy, and presents a moist alluvial soil, especially in the neighbourhood of extensive woods. There are few residents in Holland who escape it, and the island of Walcheren and borders of the Scheldt were fatal sources of the disease to our troops during the last war. In England it occurs in the low grounds of Kent and Essex, and the fenny parts of Lincolnshire and Norfolk. In France, the aguish districts are the valleys of the Loire and the Auge, as well as the south coast, from the mouths of the Rhone to the district of the maritime Alps. In Italy the disease is met with in the Mantuan and Roman territories. The Pontine marshes between Rome and Naples are especially dreaded as a source of intermittent. It is also common in south Germany, in the course of the Danube, and in many of the Mediterranean islands, as the Ionian and Cyclades. Similar localities favour the production of ague in Asia, Africa, and America. It is especially frequent in the Delta of the Ganges, in the neighbourhood of the Senegal, Gambia, and Zaire rivers, and in the large tracts of alluvial soil washed by the Mississippi, Red River, Ohio, &c.

We must not suppose, however, that marshes and a moist alluvial soil are necessary causes of intermittent, for in India it sometimes prevails in hilly districts, at a considerable elevation, and is known by the name of hill-fever. It also occurs in the Maremma of Italy; at Cleveland, in Yorkshire; throughout Estremadura, in Spain; in the Nepaul and Malwa forests, and in other places where no marshes exist. We may therefore conclude with Dr Fergusson, that the cause of intermittent is a condition of the atmosphere occasioned by evaporation from the earth's surface, by solar rays rather than by currents of air. The frequency of the disease during the autumn months is in favour of this theory.

The occurrence or absence of intermittent fever in particular districts, according as the circumstances just alluded to be present or absent—be induced or prevented, is another proof of its correctness. Thus it is not a common affection in Paris, but in 1838 I saw it very frequent in the wards of M. Piorry, at la Pitié Hospital. It arose among the workmen of the St Germains and Paris railway, who, at a particular part of the line, which was low and marshy, caught the disease in great numbers. They nearly all came to la Pitié, as M. Piorry cured the disease rapidly by large doses of quinine, and was in consequence celebrated among them; and thus, whilst numerous cases were always present in that hospital, it was very rare in Paris generally. On the other hand, there are many places in which ague was once common, where it is now rare, from the draining of marshes, or local improvements in cities. Thus it was formerly common in London, in the district which surrounded the Tower, but disappeared when the ditch was allowed to become dry. I have also been told that, in Edinburgh, when the valley which now separates the old from the new town was a marsh, ague was frequent. At present it is very rare, and never met with except, as in the two cases we have seen in the wards, in individuals who have caught the disease elsewhere and travelled to this city.

With regard to the nature of intermittent fever, we know nothing, although we infer that the peculiar condition of the atmosphere alluded to causes a peculiar change of the blood, on which the disease essentially depends—but the nature of that change—why it should occasion an intermittent instead of a continued effect—why it should produce in different people a quotidian, a tertian, or a quartian, &c. &c.,—of all this we are ignorant. I cannot see that its

pathology has in any way been advanced, by endeavouring to connect it with diseased spleen. No doubt this organ is frequently enlarged in ague, and in chronic cases becomes hypertrophied and indurated. It is also especially liable to undergo changes of texture in continued fever, as we shall subsequently see. Piorry contends that congestive enlargement of the spleen is the primary change, and that the general fever is a result. He has brought forward numerous cases, showing that, in ague, this organ may be demonstrated by percussion to be enlarged, and that recovery is commensurate with its diminution in bulk. He cites one case where an individual was knocked down in the street by the shaft of a carriage which struck him on the left side over the spleen, and in whom the resulting fever was distinctly intermittent. This may have been a coincidence. Careful observation, however, has satisfied me that there is no uniform relation between the enlargement of the spleen and the intensity of intermittent fever, as M. Piorry supposes. I shall also direct your attention hereafter to a series of cases in which the spleen has been much hypertrophied, and no ague occasioned. On the other hand, without denying that lesions of the spleen are very common in connection with ague, we are unable in the present state of pathology, to determine whether this be a cause or an effect, or indicate why lesion of this organ should sometimes be connected with an intermittent, at others with a continued fever.

The treatment which experience has proved to be most certain and rapid, is that by quinine ; and I am satisfied that tolerably large doses are more efficacious, than small ones frequently repeated. I usually give five grains three times a-day, and a scruple two hours before the occurrence of the attack, and have never seen a case which resisted this treatment. Much larger doses have been given. Thus I have seen Piorry give fifty grains for a dose, with the effect in recent cases of at once cutting it short, and rapidly reducing the engorgement of the spleen ; but a permanent and quick cure I believe to be equally well effected by the medium dose formerly recommended. Quinine in large doses produces very inconvenient effects, such as cephalalgia, vertigo, tinnitus aurium, deafness, and other symptoms, which, should any cerebral complication exist, will render it fatal. During the prevalence of intermittent at la Pitié, in 1838, a man was treated with large doses of the drug, and the head symptoms attributed to its stimulant action. He died, and on examination, acute meningitis, with exudation of lymph on the membranes, was found.

Ignorant as we are of the real pathology of intermittent fever, we of course know nothing of its rational treatment. The cure by quinine is one of the few certain results of empirical practice. Why it acts in relieving this form of fever and no other, is a mystery ; but we observe that it also acts beneficially in other forms of periodic diseases, such as in neuralgia and epilepsy. Hence it may be called an antiperiodic. Its so-called tonic properties are very feeble, if they exist at all, and there can be very little doubt that large quantities of this valuable drug are annually wasted in a vain attempt to give strength, increase the appetite, and so on, for which other remedies are much better adapted.

Some years ago, Dr Douglas Maclagan introduced the sulphate of bebeerine, as a substitute for quinine, and at the time I tried it with great success. Of late years, however, it seems to have lost its virtues, whether from change in the mode of preparation, or otherwise, I do not know. Certainly its good effects cannot now be depended on. Salicine is a useful drug in intermittent, and from numerous experiments I saw made with it in the wards of la Pitié, in 1838, it may be depended on when given in double the quantity of quinine. In some chronic cases which have resisted quinine, arsenic has been found useful. I have frequently seen in the south-west of England, a case cured at once by a scruple of Cayenne pepper suspended in water. Indeed, a vast number of remedies have been found occasionally beneficial in intermittent fever, but there are none so uniformly successful as quinine.

REMITTENT FEVER.

Blanche Scott, æt. 3 three years, of scrofulous habit, admitted into the clinical ward, November 10th, 1851. Her mother states that she has enjoyed good health until a fortnight ago, when she was attacked with severe diarrhœa, —the stools being thin, of a dirty green colour, offensive odour, and mingled with slimy matter. She became dull and peevish during the day, but restless and uneasy at night, when the skin became hot and the countenance flushed. The diarrhœa and fever continued eight or ten days, accompanied with loss of appetite, and great thirst. During the last four days there has been delirium ; loss of consciousness ; occasional moaning ; uneasy gestures in demand for drink ; hands frequently raised to the head, with a slight scream ; constant picking of the nose and angles of the mouth with her fingers ; latterly, retching and vomiting, and passage of the urine and fæces in bed.

On admission she presents the following symptoms :—Unconsciousness of surrounding objects, not recognising even her mother ; pupils not contractile to light ; slight strabismus of right eye ; frequently puts her hands to the head, which is rolled about uneasily ; continual grinding of the teeth, low moaning, and occasional muttering. Tip of tongue, which is all that can be seen, very dry, and of scarlet colour ; loss of appetite ; constant thirst ; vomiting ; involuntary discharge of fæces and urine ; on pressing the abdomen uneasiness evidently experienced, and moaning increased. Skin hot and dry ; no eruption ; a small abscess at the back of the neck, with a sanious discharge. Action of heart feeble and fluttering. Pulse 140, small, and occasionally intermittent. Breathing short and hurried ; no râles. *The head to be shaved, and a blister to be applied over the scalp. To have ℥ij. of sherry wine. November* 12*th.* —The fever increased towards night, and she was very restless. This morning it has abated. Skin now cool ; pulse 120, stronger and regular ; no strabismus ; still unconscious. Pus has formed below the blistered cuticle. *November* 13*th.*—Accession of fever last night ; the pulse rising to 160, and becoming sharp. This morning consciousness has returned ; fever abated ; tongue dry, brown, and cracked ; swallows without difficulty ; pulse 120. *November* 15*th.* —There are still accessions of fever at night, and remissions in the morning. The scalp is swollen and boggy to the touch, and pus oozes from it on making pressure. All movement of the head causes the child to cry. No tenderness of abdomen. Bowels are opened three times daily. Fæces are more consistent, of dull green colour, and offensive smell. Pulse 110, more full. Three parallel incisions were made through the infiltrated scalp, by which a considerable quantity of pus was evacuated. *To take ʒj. of cod-liver oil three times a-day. Chicken diet. Continue the wine.* From this period she rapidly improved. The remittent fever ceased on the 18th. Extensive sinuses formed in the scalp, covering the occiput and neck, which, however, gradually healed on the application of a sulphate of copper lotion. Slight bronchitis appeared on the 25th. The appetite soon after became very good ; her strength improved. The incisions in the scalp had perfectly cicatrised on the 1st of December, and on the 11th she was discharged ; the abscess in the neck, however, not having quite healed.

Commentary.—In this case the fever was of a distinctly remittent type,— the accessions being very marked at night, and the remissions very considerable in the morning. It commenced with diarrhœa, with intestinal, followed by cerebral, symptoms. Was it a case of gastro-enteritis, or of cerebral meningitis, or, as these disorders are called by some, remittent fever, or acute hydrocephalus ? No doubt these two separate diseases exist ; but if you ask me by what symptoms you may distinguish one from the other in children at an early period, I should be at a loss to reply. In the whole range of practical medicine, this must be allowed to constitute a question of the greatest difficulty to decide. Indeed I am inclined to consider that it cannot be done until the disease is so far advanced as to render the cerebral symptoms

unequivocally predominant. In systematic works on the practice of physic, you will find the diagnostic characters of the two diseases set forth with wonderful order and propriety; but if you depend on those at the bedside, you will, in the majority of cases, be greatly disappointed. Still these symptoms, as so set forth, are important, and should be studied. They are as follows:—

Remittent Fever.	*Hydrocephalus.*
Head, slight pain in.	Head, violent pain in; tossing of; drawn backwards, and bored in pillow.
Delirium at night frequent; convulsion rare—sometimes at onset.	Delirium seldom; convulsion not early—more towards end of disease; aversion to light and noise.
Easily aroused.	Roused with difficulty; stertorous breathing; squinting; paralysis in late stage.
Cry fretful, if any.	Cry peculiar, sharp and shrill; frequent sighing.
Hands usually thrown about bed.	Hands tossed towards head.
Countenance heavy and dull; vacant expression, as of fever in adult.	Countenance sometimes anxious, sometimes dull.
Neither knitting of brows nor pupil of eye affected.	Knitting of brows; wakefulness; pupil of eye contracted in early stage,—sometimes oscillatory, afterwards dilated.
Senses of sight and hearing often dull.	Senses of sight and hearing often acute in early stage.
Pulse quick throughout the disease.	Pulse quick, but irregular in its action and force in early stage; often beating of carotids, and pulsation and prominence of fontanelle; pulse afterwards becomes slow, but, on raising the child, again quickened.
Bowels occasionally constipated at first; frequently relaxed.	Bowels constipated, and very difficult to move.
Motions various; often clayey and deficient in bile; very offensive.	Motions peculiar and characteristic—dark green, and slimy, like chopped spinach.
Vomiting occasionally at first, but never continuous.	Vomiting early in first stage; often very constant, especially on assuming the erect posture or sitting up.
Pain often in iliac regions, particularly the right.	Pain occasionally at hypochondrium.
Abdomen in advanced stage, sometimes tumid.	Abdomen drawn in in advanced stage.
Appetite mostly destroyed; will not take anything.	Appetite sometimes good; will take food.
Thirst often great from commencement.	Thirst not great in first stage; often in latter stage great avidity for constant drink.
Tongue often loaded with yellowish-white fur, in gastric form, and elongated and injected papillæ, giving it a "strawberry appearance," red, dry, and occasionally brown, in malarial form.	Tongue white; nothing indicative.
Skin, very great heat of, sometimes equal to exanthemata or pneumonia;	Skin, increased heat of, but not great—less than in remittent fever; after-

abdomen generally hotter than head; picking of skin, especially of nostrils, corners of eyes and mouth.	wards becomes cold; head the hottest part.
Paroxysms pretty regular; exacerbations towards night, remissions in morning.	Varies in intensity, but without any regularity.
Age, seldom occurs under three years, more frequent after fifth year; not influenced by sex or constitution.	Age, frequent under third year; seldom after fifth year; more frequent in boys and in scrofulous constitution; hereditary.[1]

Now, if you take into consideration the symptoms observed in the case before us, you will see that they partake of the characters of both diseases, as here set forth. Such I believe to be really the case, the old distinctions between remittent fever and hydrocephalus having no basis on morbid anatomy. The former, however, is connected with irritation in the digestive organs, the latter with cerebral congestion or inflammation. It is clear that these two lesions may be conjoined in different cases in various degrees, and hence the different aspects presented in practice. The case of Scott was one of this description, commencing with symptoms of intestinal derangement, accompanied by fever of a remittent type, complicated at a later period by cerebral congestion of an asthenic character; in short, the hydrocephaloid disease of Marshall Hall.

The treatment was in accordance with this view of the case, consisting of small quantities of wine, good nourishment, blisters to the scalp, and subsequently cod-liver oil. Several of you expressed the opinion that this was a case of hydrocephalus, and a few were inclined to give mercury. As to hydrocephalus, much depends on what is meant by that term. If by it is understood cerebral meningitis, then it was not hydrocephalus; but if it meant certain cerebral symptoms, independent of any particular lesion, then it was. Such symptoms, however, may arise from exhaustion, as well as from over-excitement, and the one we had to do with was certainly a case of this kind, coming on as it did, after protracted diarrhœa and fever.

As to mercury, I have no hesitation in saying, had we depended on it, as some recommend should be done in similar cases, the patient would never have recovered. It has been said that mercury is the sheet-anchor of the practitioner in hydrocephalus. I have never seen it beneficial in undoubted cases of cerebral meningitis, and the diagnosis in the vast majority of instances is so uncertain as to warrant the suspicion, that the recoveries which have taken place were not those of true inflammation. In this little girl, notwithstanding the delirium, the coma, the screams, the tossing the hands towards the head, the strabismus, and the insensible contracted pupil,—all of which, we observe, have been placed among the principal evidences of hydrocephalus, the treatment was brought to a successful conclusion by stimulants and nourishment. I do not tell you that this will always succeed; but whenever such symptoms follow protracted diarrhœa, and are accompanied by remittent fever, I am satisfied you may place more reliance upon such treatment, aided by the powers of nature, than upon the vaunted, but in my opinion hypothetical, powers of mercury.

FEBRICULA.

CASE I.—Margaret Divine, æt. 42, admitted 26th Nov. 1851. Was attacked with rigors on the 23d, after complaining for two days before of headach and general debility. On admission, complained of pain in the limbs, and general dull pains over the body. Had no appetite, but great thirst, with a dry furred tongue; she is very subject to pyrosis; skin was hot and dry, pulse 80, strong; a slight murmur accompanied the first sound of the heart. ℞. *Sol. Acetat. Ammoniæ*, ℥i.; *Vini Antimonialis*, ʒij.; *Aquæ*, ℥iij. *M.* To take one tablespoonful every four hours.

[1] Taylor's Essay on Infantile Remittent Fever. 1851.

November 28*th*.—Better to-day; pulse 72; a sediment filling one-fourth of the glass is deposited in the urine; still general dull pain of surface. 29*th*.—The general pains are gone. She feels quite well, and wishes to rise; she was now convalescent, but owing to weakness, was not dismissed until the 15th of December.

Case II.—Susan Rennie, wife of labourer, æt. 49, admitted 15th December 1851. On the 11th, was seized with severe rigors, followed by pain in the lower part of the back and the limbs; with frequent alternations of shivering and perspiration during the day; there was severe headach, with loss of appetite, and oppressive thirst. On admission, the tongue was slightly furred; she had constant nausea, and vomited nearly everything she took; the skin was hot, but moist; there was no eruption on her person; she had a short cough, with trifling expectoration. Pulse 76, small. She continued in this state till December 19th, when, after sweating and a lengthened sleep, the fever left her, and she became convalescent, and was dismissed January 1. The treatment consisted of salines, anodynes, and stimulants.

Case III.—Thomas Stevens, æt. 21, servant of cowfeeder, admitted Nov. 24, 1851. On the afternoon of the 23d, while engaged in his usual work, he was seized with severe rigors, headach, and pain in the back; he passed a sleepless and uneasy night, and on attempting to resume work next day, found himself quite unable to do so, from return of the rigors, and aggravation of the headach. Had not been exposed as far as he knew, to contagion. Had been already a patient in the house several times, having suffered from fever on three different occasions. On admission, the tongue was moist and clean, and the appetite was not much impaired, but he had very oppressive thirst. Bowels had been irregular some time before admission. On examination of the chest, slight bronchitis of the left side was found to be present, and the sputum was thick, viscid, and muco-purulent. Skin was very dry and hot, he complained of pain in the head, principally in the frontal region, and of a throbbing character. Pulse 72, of good strength. He was ordered a full dose of castor-oil, which produced copious evacuations from the bowels; and following mixture:—℞. *Vini Antimonialis*, ℥ss.; *Sol. M. Morph.* ʒi.; *Aquæ*, ℥vss. *M.* Take ℥ss. every second hour. He continued to complain of headach and general restlessness, and the pulse kept about 80, very full and strong till the evening of the 25th, when he began to perspire a little; and on the forenoon of the 26th, he had profuse sweating. On the 30th, the antimonial solution was stopped; he improved rapidly, and was dismissed quite well, on the 8th of December.

Case IV.—Andrew Downan, æt. 11, tobacco-boy, admitted January 14th, 1852. On the 11th was attacked by violent headach, lost all appetite for food, but felt exceedingly thirsty; his skin felt very hot, and he complained of general langour and debility. Had no distinct rigors, or other premonitory symptoms. Had suffered from typhus fever about five years, at which time he was nine weeks in the house. On admission, tongue was dry, of florid red colour, but thinly coated with a white fur, through which the red papillæ were very conspicuous. No appetite, but considerable thirst; skin hot and dry, without eruption; has had no sweating since he became ill. He continued two days in the house, but at the end of that time he felt well enough to get out of bed, but left the ward, and did not return. He had profuse diaphoresis the next morning after admission, the skin became cool and moist, and his pulse fell to the natural standard.

Commentary.—Febricula was the most common form of continued fever during the early part of the winter session in Edinburgh, and the four cases above given, constitute good examples of the disorder as it existed in the city during that period. It will be observed that the fever in all of them was very strong, and the rigors well marked, although the pulse was not greatly accelerated. It is impossible to distinguish such cases at the commencement from typhus, a circumstance, as we shall see, of great importance, when the question comes to be, whether or no we can arrest the progress of a continued fever, after it has fairly set in. At the commencement of the session, Dr Dundas of

Liverpool, was kind enough to communicate to me the results of his treatment of fever by large and repeated doses of quinine. He had found this practice beneficial in arresting its course, and from his representations I was induced to give it what I trust may be considered a fair trial. It must be evident, however, that the question of how far it be possible to cut short continued fever, could never be tested by adopting any practice in cases of febricula such as those above narrated. It ought to be a *sine qua non* in all such trials, not to commence the treatment until the seventh day. I find, however, that this rule has not been strictly adhered to, although the prevailing type of fever at the beginning of the session, was febricula. Notwithstanding, it so happens that in none of the cases could we observe that the treatment by quinine exerted any marked influence on the progress of the disease. Other phenomena, however, were witnessed, and the remarkable effects of the drug in diminishing the force and rapidity of the pulse were so carefully observed as to warrant my placing the facts before you somewhat *in extenso.*

(*To be continued.*)

CLINICAL SURGERY.

REPORT OF SURGICAL CASES OCCURRING IN HOSPITAL PRACTICE.

BY R. J. MACKENZIE, ESQ., F.R.C.S.E., ETC.

On the Use of Chloroform in the Treatment of Stricture of the Urethra with Retention of Urine.

In the treatment of ordinary stricture of the urethra, the use of chloroform is not called for. On the contrary, its employment, where no unusual irritability of the urethra exists, must evidently be attended with disadvantage, as the feelings of the patient form, to a certain extent, a guide to the surgeon in passing the instrument through the constricted part of the canal.

It is in the irritable form of stricture, accompanied with spasmodic contraction of the muscular fibres surrounding the urethra, that advantage is occasionally derived from the use of chloroform. Cases of this kind occur, where, every now and then, during the treatment by dilatation, the progress of cure is checked for a time,—a bougie of small size is tightly grasped in the stricture, which a day or two previously easily admitted a larger instrument. This difficulty appears to be caused by spasm of the muscular fibres surrounding the canal; and it is in such cases that the use of chloroform decidedly facilitates the introduction of instruments.

But it is when retention of urine occurs in cases of this kind, that the advantage of chloroform is more prominently marked, and of which, I think, the simple details of the following case give undeniable proof :—

James Pentland, æt. 23, admitted into the hospital October 19, 1851, on account of stricture, with retention of urine. He stated, that for the last four years he had served in an infantry regiment, during the greater part of which time he had suffered from stricture of the urethra, on account of which he had been discharged, as unfit for military duty, a few months previously to the date of his admission into the hospital. He had repeatedly, whilst in the army, suffered from retention of urine, which had been relieved occasionally with great difficulty, and with very small-sized catheters, at other times with instruments of larger size.

During the last month, his difficulty in making water has increased; and on the day before his admission, he again suffered from retention, and the surgeon under whose care he had latterly been, and who had, on various occasions, passed instruments into his bladder, failed in introducing a catheter. The patient was then sent to the hospital, where, after a good deal of difficulty, I succeeded in passing a small catheter (No. 2) into the bladder, and removed a large quantity of urine. The catheter was tightly grasped, and an induration was felt by the finger at the seat of stricture—the bulb. The catheter was re-

tained in the bladder for two days, when it was withdrawn, and he was able to pass his water easily in a small stream.

On the 24th, at the hour of visit, I found him again suffering from retention. A large quantity of urine had accumulated, the bladder forming a prominent tumour, which reached nearly as high as the umbilicus. On attempting to introduce a catheter, I found I was unable to pass the smallest sized instrument through the stricture. No. 1 was passed within the constricted part of the canal so far that it could not be withdrawn without using a considerable degree of force; but, after repeated trials, I was foiled in reaching the bladder.

Under these circumstances, I was about to request the assistance of Mr Syme, who was in the hospital at the time, when it occurred to me that the case was a good one to test the existence of muscular spasm by the use of chloroform. After inhaling the vapour for a few seconds, the patient became much excited, and struggled a good deal; but no sooner had the stage of excitement passed off, and the relaxed state of the muscles and stertorous breathing evinced the full action of the anæsthetic, than *the urine was expelled in a forcible and continuous stream* by the side of the small catheter, the point of which I had retained within the constricted part of the canal. I immediately withdrew the catheter, which now lay loosely within the canal, and at once passed No. 2 into the bladder with perfect ease.

After emptying the bladder, and before withdrawing the catheter, I requested one or two of the gentlemen who were present, and who had felt the tightness with which the smallest instrument had been grasped, to satisfy themselves that the larger catheter now lay loosely in the canal. I believe, indeed, that Nos. 4 or 5 might now have been passed as easily as No. 2.

No further difficulty occurred in the treatment of the case. The contraction of the canal was overcome by gradual dilatation, and the employment of chloroform was not again required. On the 27th, No. 2 only could be passed. On the 29th, Nos. 2 and 3. On the 1st of December, the patient was dismissed from the hospital, No. 16 having been passed two or three times before his dismissal. He returned to the hospital two or three times afterwards, when my house-surgeon, Mr Moir, found no difficulty in passing the largest sized bougie. His urine was passed in a full stream, and his former symptoms were entirely relieved.

In recording this case, it is not my wish to advocate the employment of chloroform as a general rule, even in those cases of stricture where considerable irritability of the urethra exists; but to call attention to the distinct proof of the constriction in this case being much increased by muscular spasm, and of this being at once relieved by the action of chloroform, as well as to the fact, that the bladder retained its expulsive power, whilst the retentive muscular fibres were relaxed.

The involuntary evacuation of the bladder is a frequent effect of the inhalation of chloroform, which is not difficult of explanation. The tendency of the bladder to contract, when moderately distended with urine, is resisted, whilst the individual retains his senses, by an effort of the will, by the contraction of voluntary muscular fibres. Under the full influence of chloroform, the voluntary muscles are paralysed, but the involuntary muscles retain (unless the inhalation is carried to a poisonous extent) their contractile power. The muscular movements of respiration and circulation continue. The contractions of the uterus in parturition are only partially, if at all, impaired; the bladder in the same way retains its expulsive power. In the operation of lithotomy, we see the urine expelled through the opening in the neck of the bladder with the same force when the patient is in a state of complete anæsthesia, as when chloroform has not been inhaled. The organ, though deprived of sensation by the action of the chloroform, retains its sensibility to its natural stimulus, and retains, at the same time, its contractile power. The muscular fibres, which, in a state of health, resist, through an effort of the will, the expulsion of the

urine, are, in irritable stricture, spasmodically contracted. The spasm is relieved by the action of the chloroform, and the resistance to the flow of urine being thus removed, the bladder expels its contents.

Professor Simpson has kindly furnished me with the notes of a similar case, which occurred in the practice of Mr Creeke, of Leven, whose account of the case is as follows :—

"A young sailor, robust and active, aged 25, applied to me, September 14, 1851, not having voided urine for twenty hours. He has had a stricture for some years, and had a very small catheter introduced in Bombay about eighteen months ago. He had not much difficulty in making water during his voyage from India, and has lived rather freely since his return home.

"Finding all attempts at introducing a catheter useless, I proposed to administer chloroform, but to this he demurred so strongly as to induce me to consult my friend Dr George Forbes, of Kennoway, who also attempted the introduction of the catheter without success. The administration of chloroform was again proposed, and, as he was suffering considerably from distension of the bladder, he consented. The chloroform vapour was then inhaled for about a minute, when he exclaimed, 'I'm all right now!' In fact, he was passing urine quite freely (allowing for the organic lesion before spoken of). I kept up the action of the chloroform slightly, and he emptied the bladder to his astonishment and great relief."

The account of these cases proves, I think, the value of chloroform as an auxiliary to the introduction of the catheter, or even as a means itself of relieving the distended bladder. It acts in the same manner as the warm bath, but much more speedily and effectually. Without its employment, I think it is not improbable that in both the above cases it would have been necessary to have opened the urethra from the perineum, or to have punctured the bladder.

Rupture of Urethra, with Extravasation of Urine.

William Cochrane, a stable-boy, æt. 14, was admitted into the hospital early on the morning of January 29, 1851, on account of an injury of the perineum, sustained about four o'clock on the previous afternoon, of which he gave the following account :—In trying to walk along the top of a paling, he missed his foot, and fell astride the fence, the entire violence of the fall being sustained on the perineum; he then fell sideways to the ground, where he lay for two or three minutes, sickened by the pain and shock of the injury. He immediately afterwards perceived a swelling in the perineum, but, as the pain soon passed off, he took little further notice of it, and went on an errand, and returned home, walking a distance of a mile with little discomfort or inconvenience. He then took his supper of porridge and milk, and afterwards tried to make water, but found he was unable to do so. During the night his desire to make water became more urgent, and after several ineffectual attempts to empty his bladder, he applied for surgical assistance. A catheter was introduced, but its point was arrested in the perineum, and a few drops of blood only passed through the instrument. No palpable signs of distension of the bladder, nor of extravasation of urine, existed at this time. He was immediately sent to the hospital, where he arrived about six o'clock A.M., after a journey of five miles in a cart. I saw him shortly afterwards, and found him in a very distressing condition. The bladder, distended with urine, formed a tense and projecting tumour, which reached as high as the umbilicus; the perineum was distended to an extent which I had never previously witnessed; and the scrotum, infiltrated with blood, formed a round tense tumour, of a nearly black colour. The discoloration and swelling extended along the groins and over a considerable part of the abdomen. The surface of the body was cold, the pulse small and very rapid, and the features were sunk and expressive of great suffering.

Chloroform having been administered, the boy was placed on a table in the position for lithotomy. The left forefinger having been introduced into the rectum, a bistoury was thrust with its edge forwards deeply into the swollen peri-

neum immediately in front of the anus, and carried forwards in the central line as far as the scrotum. A quantity of bloody urine and some coagula were discharged by the incision, but little or no bleeding took place. The lacerated cavity was then cleared of coagula with a sponge, and a catheter was introduced along the urethra from before, its point passing through the ruptured urethra into the wound about an inch behind the scrotum. On separating the edges of the posterior part of the wound, the urine was now easily seen flowing from the orifice in the membranous portion of the canal (the point at which the rupture had taken place). The orifices of the divided urethra had been separated by the extravasation to a distance of between two and three inches. The point of the catheter was then introduced into the posterior orifice, and carried onwards to the bladder. The scrotum was next freely incised, and the catheter, after the bladder was emptied, fastened in the usual way.

The boy was immediately removed to bed, and hot bottles placed around him. After taking a little wine, he rallied speedily from his collapsed condition. An opiate was given, and in half an hour after the performance of the operation, he had fallen into a sound sleep.

Six hours afterwards, the swelling of the perineum and scrotum had nearly entirely subsided, and the gaping wounds were reduced to about a third of their original size. The fulness of the groins and lower part of the abdomen, in which parts no incision had been made, had, too, quite disappeared.

The febrile excitement which followed was very trifling, and had entirely subsided at the end of three or four days. The catheter was withdrawn on the 1st of February, and for three days afterwards the urine passed entirely through the perineal wound. After this, the quantity passed by the natural channel gradually increased, but a few drops occasionally passed through the perineum till so late as six weeks after the performance of the operation.

On the 18th of February, a bougie of as large a size as the orifice of the urethra would admit (No. 6), was passed into the bladder, and was introduced daily after this as long as he remained in the hospital.

He left the hospital on the 19th of April in good health, the wound having been entirely healed for about a month previously.

Before he left the hospital he was taught to pass a bougie into the bladder, and was directed to introduce No. 5 every second day. He returned about the middle of July, suffering from retention of urine, having omitted to use his bougie for about a week. No. 3 catheter was with difficulty introduced, and the urethra was again gradually dilated to its normal size in the course of a few days.

Since that time he has continued to introduce a bougie regularly, but still (February 1852) finds that he has difficulty in making water if he neglects the use of the bougie for more than a week.

Rupture of Urethra.

Samuel M'Donald, æt. 17, a groom, admitted May 12th, 1851, on account of retention of urine from injury of the perineum. He states that three days ago, while on horseback, the horse started, and he was thrown sharply forwards on the pommel of the saddle. He immediately experienced severe pain in the perineum; blood flowed from the urethra, and on his attempting to void urine a short time afterwards, he found he was unable to do so. He immediately applied for surgical assistance, and Mr Macdonald of Leith succeeded, after some difficulty, in introducing a catheter into the bladder. The urine which was drawn off was dark coloured, and mixed with blood.

Considerable swelling of the perineum ensued during the next two days, and as the catheter was passed with difficulty, he was sent to be under my care in the hospital.

On his admission, there was ecchymosis and a hard and painful circumscribed swelling of some size immediately behind the scrotum. On introducing a No. 6 catheter, it was arrested before it reached the bulb, and after a little trouble

was passed on to the bladder, and the urine drawn off. The catheter was withdrawn; fomentations were applied to the perineum, and he was directed not to attempt to make water. The catheter to be passed three times a-day.

The difficulty in passing the catheter diminished from day to day, and the swelling in the perineum gradually subsided.

On the 15th, he passed his urine without difficulty, but with some smarting along the urethra. From this time he continued to make water in a small stream, but without difficulty. To prevent the contraction of the urethra, bougies were passed daily, but contraction had already so far taken place; and before his leaving the hospital on the 27th, the urethra would not admit a larger instrument than No. 7.

He was directed to return to the hospital, to have an instrument passed, every second or third day. He returned for this purpose for about ten days, when Mr Moir passed Nos. 6 and 7; but at the end of that time, feeling himself very well, he discontinued his visits.

February 15th, 1852.—Mr Moir tells me that he visited this patient two days ago, and that, on examining his urethra, he found that he could with difficulty pass No. 3 bougie. The patient is suffering from increasing symptoms of stricture.

These cases present excellent examples of the usual effects of severe blows blows on the perineum. Their history, too, indicates the treatment which should be followed, according to the degree of the injury, and according to the symptoms which are produced by its effects.

In the first case, the violence which caused the rupture of the urethra was very great; but as long as the urine did not escape into the cellular tissue of the perineum, the boy suffered but little pain or inconvenience. He walked the distance of a mile, took his supper as heartily as usual, and then went to bed and fell asleep. It was only after repeated ineffectual attempts to make water, ten hours after the receipt of the injury, that he became uneasy as to the consequences of his fall. Dr Balfour, of Cramond, under whose care he was, informs me that at this time there were no signs of extravasation of urine in the perineum, nor of distension of the bladder. He drank freely, however, during the night; and before he arrived at the hospital, the urine had accumulated rapidly in the bladder, and had escaped in large quantity into the cellular tissue through the breach in the urethra.

It is probable that in cases of this kind the bladder is more or less paralysed by the blow, and, in addition, that the lacerated orifice of the urethra is obstructed by the swelling of the parts and the extravasated blood, which are the consequence of the injury. Such impediments to the flow of the urine can alone tend to prevent the extravasation of urine, which otherwise must necessarily occur on the patient attempting to empty the bladder after such an injury. As the bladder becomes distended, the mechanical pressure of the urine must soon overcome the temporary obstruction to its escape, and the urine is forced into the perineum.

In the case of Macdonald, it is probable that extravasation of urine was prevented at first by the same cause. He attempted, a short time after the occurrence of the accident, to make water, but finding that he was unable to do so, he immediately applied for surgical assistance, and a catheter was passed into the bladder. The absence of extravasation of urine in this case indicates the advantage of immediate interference after such injuries. The escape of blood by the orifice of the urethra, and the ragged state of the canal felt on introducing the catheter, were sufficient proof of laceration of the urethra having taken place.

The treatment which was adopted in the first case requires little comment; the strongly marked signs of infiltration of urine showed clearly what was required to be done. The only doubtful point, was the necessity of incising the integuments of the groins and abdomen, into which parts the extravasation had extended. This was delayed, as a free outlet was given to the urine by the

incisions in the scrotum, and as the boy was in such a prostrated state, that even a trifling loss of blood was to be avoided. The rapid subsidence of the swelling in these parts, however, following the incisions in the perineum and scrotum, rendered further division of the integuments unnecessary.

No sloughing of the cellular tissue followed the urinary infiltration in this case ; on the contrary, the wounds assumed a healthy appearance very speedily, a circumstance which is to be accounted for by the urine being but slightly acrid in so young a subject, and by its having been rendered still less so by the boy having drunk a large quantity of water after the receipt of the injury, as well as to the extravasated fluid having been evacuated freely, and before it had remained long within the tissues.

The catheter, after being introduced, was retained within the bladder, as is usually done after such operations, for about three days, so as to prevent obstruction of the torn orifices of the urethra, and to keep their edges as far as possible in apposition.

In the case of Macdonald, the catheter was not retained within the bladder. Had great difficulty been experienced in introducing the instrument, it might have been advisable, as a precautionary measure, not to have withdrawn it. I believe, however, that it is better in cases of the kind where an instrument can be introduced with tolerable facility, to withdraw the catheter after emptying the bladder, and to introduce it two or three times in the twenty-four hours, giving the patient strict injunctions to refrain from all attempts at micturition. When a catheter is retained in the bladder, a small quantity of urine always escapes by its sides, and might thus give rise to infiltration of the tissues through the breach in the walls of the urethra.

Stricture of the urethra, the inevitable consequence of such injuries if not carefully attended to for a long period, occurred in both these cases. In the first, the more severe injury, the contraction of the canal is easily obviated by the regular introduction of a bougie. In the second, the neglect, on the part of the patient, of this precautionary measure, has already led to the formation of a tight stricture at the seat of injury.

The tendency to contraction under such circumstances seems to continue for a very long period. Cases of obstinate stricture are of common occurrence, in which the disease has owed its origin to an injury received many years previously. Mr Liston mentions one case, in which extravasation of urine had occurred and the perineum had been incised, and in which the tendency to contraction continued eight or ten years afterwards.[1]

Part Fourth.

PERISCOPE.

ANATOMY.

ON THE ART OF INJECTING BLOODVESSELS. BY PROFESSOR HARTING, OF UTRECHT.

[The old Dutch anatomists were long famous for their skill in preparing injected anatomical specimens; and in this country it is generally believed that they either altogether concealed the nature of the processes which they followed, or, by the affectation of mystery, deterred imitators from repeating them. It is

[1] Practical Surgery, 4th Edition, p. 466.

not so in modern times. Ruysch has worthy followers in Schrœder van der Kolk and Harting; and thanks to their enlightened spirit, the art of injecting, as practised at Utrecht, is no secret. We have great satisfaction in transferring to our pages the following translation of the chapters on "Injection of Vessels," from Harting's great work "Het Mikroskoop."]

The injecting of the finest vessels with coloured materials affords an assistance absolutely indispensable for the microscopical study of the anatomy of animal organs. Indeed it is impossible in any other way to convince oneself of the mode of distribution, course, nay, very existence, of the most minute capillaries, as these are in fact very seldom found full of blood, and even when this is the case, the transparency of the blood-corpuscles is so great, that they can only be distinctly seen at points where they, or the containing vessel, are well isolated. Any one who has taken much trouble thoroughly to investigate the structure of an organ, but without injecting its bloodvessels, will learn, on continuing his observations with the assistance of well injected preparations, that his first ideas of the structure were most incomplete and inaccurate. Injection not only shows the course of the vessels, but as this is always intimately connected with other structures, serves to unfold *their* nature and relations; the whole picture becomes more comprehensible—more plastic, which is in great measure due to the strong contrast between the tissues and the colouring materials used for the injection. Indeed a successful injection never fails to make a vivid impression upon the eye which observes it for the first time,—an impression due not only to the beauty of all capillary arrangements (and how various are these in form and distribution?), but to the facility with which the microscopical picture is appreciated, and which speedily puts the least practised observer in a condition to form a distinct idea of what he has seen. This can hardly be said of any other class of microscopical objects.

Directions for making such preparations will not be out of place here. Yet, lest I should encroach too much on the province of general practical anatomy, I shall be brief, and limit myself to the description of what I have, by personal experience, found to be useful.[1]

The instrument most generally used in making injections is the syringe. That it must be good and clean, so that the piston shall have free play up and down, and yet accurately fill the tube, is self-evident. Its size should be regulated according to the dimensions of the preparation whose bloodvessels it is proposed to inject; for although a small quantity of fluid may be injected with a large syringe, and the want of a large instrument supplied by repeatedly filling a small one, it is certainly expedient to have two or more of different sizes. When the syringe is wide, and the dimensions of the piston large, it is difficult, on the one hand, so to regulate the pressure as to avoid rupturing the vessels of very small animals or organs; and, on the other hand, the injection of larger objects is often unsuccessful, when frequently interrupted by the necessity for recharging the syringe. For ordinary use a syringe capable of holding thirty cubic inches of water, and for smaller objects an instrument of six cubic inches capacity is perfectly sufficient.

To each syringe belong a certain number of nozzles, or canulæ, of different widths, corresponding to the calibre of the vessels into which they are to be inserted. These can be procured so fine as hardly to admit a human hair; but nozzles so fine are apt to be easily obstructed, and are hardly ever required. The most generally useful are of a calibre varying between one-third of a millimetre and three millimetres ($\frac{1}{70}$th and $\frac{1}{8}$th English inches nearly). Sometimes one meets with syringes connected with the nozzles, by means of a screw. This is unnecessary and inconvenient,—a simple sliding connection is perfectly sufficient, if the extremity of the syringe accurately fits the opening of the nozzle.

[1] For a more detailed description of apparatus used in making injected preparations, I may, once for all, refer the reader to the work of Strauss-Durkheim, already quoted, vol. i., p. 112; and to the English work of Alfred Tulk and Arthur Henfrey, on "Practical Comparative Anatomy and Physiology," translated into Dutch, and enlarged by C. J. Snijders, 1847, p. 13.

Besides the common syringe, there are other pieces of apparatus described as serviceable for injecting, but on their several merits I can offer no opinion founded on personal experience. I believe, however, that the syringe not only surpasses them all in simplicity of use, but also in security; for the pressure made by the hand upon the piston can be perfectly regulated according to the degree of resistance felt, or the greater or lesser delicacy of the structure which is being injected.

In a few cases, however, as in injecting small and tender animals, mollusca, &c., where it is impossible to apply ligatures to the vessels, a glass pipette, drawn out at one end into a fine bent nozzle, will be found useful. The point should be conical, so that it may prevent regurgitation from any vessel into which it is fitted. The following apparatus, which any one may prepare for himself, is, however, more convenient.[1] It consists of a common glass pipette, *a, b*, of moderate width, such as may be had of any vender of chemical apparatus, and of a caoutchouc tube, *c, d*,[2] one extremity of which is attached by means of a thread to the thicker end of a fine glass nozzle, *e, f*, drawn out and turned into an obtuse angular form by the blowpipe flame. In using the apparatus, the pipette is first filled with the coloured fluid, and then introduced into the open end of the caoutchouc tube, which by its conical form it accurately closes.

The same object is now even better attained by the procedure recommended by Rusconi.[3] This consists in forming a species of trocar, with a needle and the quill of a crow, partridge, or smaller bird. In using it, the small vessel through which the injection is to be thrown is held with a forceps against the extremity of the trocar, and punctured with the needle. The quill is then directed into the puncture, and the needle withdrawn. Into the upper extremity of the quill the small nozzle of an injecting syringe, previously filled with coloured fluid, is finally inserted.

The success of an injection depends, in great measure, on the choice of the substance which is injected. For coarser injections, when it is only required to display the larger vessels, or such as are visible to the naked eye, this is easily made; but for finer preparations destined for microscopical examination, it is very difficult to provide an injecting fluid suitable in every respect, and the choice becomes here more restricted. A fluid for these finer injections should fulfill all the following conditions:—

1. It should penetrate without difficulty into the minutest capillaries, and yet neither over-distend nor tear them.

2. It should not have such a degree of fluidity as to permit it to percolate through the walls of the capillaries.

3. It should have a proper colour, permitting the distinct definition of every vessel either by transmitted or reflected light.

[1] Strauss-Durkheim, Tulk, and Henfrey, describe a similar, but more complicated, apparatus. The woodcut is reduced one-half.

[2] Caoutchouc tubes, for purposes of this sort, may be easily made from a fragment of caoutchouc sheeting, by rolling it round a glass rod, and fixing the edges together by a solution of gutta percha in oil of turpentine.

[3] *Annales des Sciences Naturelles*, 2de serie, Zööl. xvii. p. 111. Rusconi also uses for the injecting of the lymphatics of reptiles, a silver syringe with a golden nozzle. A copper one is quite as good.

4. The colour should be everywhere uniform,—that is, it should form a consistent mass, without traces of grittiness, even in the most minute vessels.

Every injection consists of a fluid vehicle containing some coloured substance.[1] The vehicles recommended are very numerous. Melted wax, fat, spermaceti, cocoa-butter, and other substances which become fluid on increase of temperature, can only be used for coarser injections. For fine injection some have greatly extolled turpentine varnish; but, although both myself and my colleague, Schrœder van der Kolk, have made frequent attempts with this substance, our injections have never been successful. The turpentine varnish has the disadvantageous property of hardening and drying very slowly, permitting the escape of injection from the extremities of the divided vessels, and the consequent soiling of the surface of the preparation.

The best vehicle is a watery solution of glue, both because the size encounters far less resistance than oil or fatty matters in penetrating the capillaries which are always in contact with blood,—*i.e.*, with a fluid consisting chiefly of water; and because the fluid congeals on cooling, so that sections or other preparations may be made and preserved with little or no risk of the injection issuing from the divided vessels.

White or light yellow coloured glue is sufficient for the preparation of the size. Its relative proportion to the water should be such, that the mixture should, on cooling, form a jelly of moderate consistence, which may be tested by letting a drop of the warm fluid fall on a cold object. On this test the temperature of winter and summer exercise some influence; and the congelation is also in some measure affected by the kind of glue employed. In general, it may be assumed that 1 part of glue to 8 or 10 parts of water is a proper strength for the solution. It is by no means necessary at once to prepare a solution of this particular strength; but a stronger size may be made, in the first instance, containing about 4 parts of water to 1 of glue.

In making the solution, care must be taken to regulate the heat, and above all, to avoid a boiling temperature, which lessens the congealing property of the mixture. When the glue is dissolved, which may be ascertained by stirring, the size is filtered through a cloth, to remove any trace of impurities which it may hold in suspension.

The number of colouring materials recommended for injections is very great; but however large the choice, there are in reality very few which unite in themselves all the requisites of a good colouring material.

Colours entirely soluble in water, such as litmus, turmeric, &c., penetrate, it is true, into the smallest capillaries, but easily transude through their walls, and discolour all the tissues. Besides, all such organic colours readily undergo changes from heat or light; while preparations into whose composition they enter, cannot be kept in any watery fluid. Those substances are consequently preferable whose particles remain suspended in the vehicle, and which are not soluble in the fluids used for preservation of specimens—such as water, spirit, and turpentine. It is for these reasons that different metallic preparations are to be regarded as the best materials for coloured injections.

I have made some careful trials in this department with a considerable number of different mixtures of substances. The following is a summary of the results of my experience:—

Yellow Injection.

Of all substances with which I am acquainted, there is none better adapted for

[1] I say nothing of quicksilver, which is by no means well adapted for microscopical injection; its weight causing it to overstrain and rupture the small vessels, and then find for itself channels among the tissues of organs. Even for injecting lymphatics it may be dispensed with, and fluids of less specific gravity substituted, as Rusconi, Breschet, and others, have recommended.—*Annales des Sciences Nat.*, 2de ser., Zööl. xvii. p. 115.

microscopical injections than the chromate of lead,[1] precipitated by the double decomposition of solutions of 100 parts of acetate of lead mixed with 52·4 parts of chromate of potass. For the convenience of the reader, I subjoin the proportions in which I have employed these substances reduced to ordinary weights and measures.

a. ℥iv. ʒj. ℈j. (2000 grs.) of acetate of lead are dissolved in so much water as will make up a measure of ℥xvi.

b. ℥ij. ʒj. gr. xxviii. (1048 grs.) of chromate of potass are dissolved in water, and the measure filled up to ℥xxxii.

For the preparation of the injection—take

1 measure of *a.*
2 measures of *b.*
2 measures of the concentrated size solution—*i. e.*, 1 part glue, and 4 of water.

First mix the solutions of the salts in a separate vessel, stir them well together for a short time, and then add them to the size. These successive steps in the process are not mere matters of indifference; for if the saline solutions be at once added to the size (without previous admixture), the precipitation will be found to be very imperfect. Care must also be taken not to allow the fluid in which the precipitate has been formed to stand too long before adding it to the size, otherwise the fine division of the colouring matter will become impaired by the aggregation of its particles.

Blue Injection.

For the last two years my colleague Schrœder van der Kolk, has been in the habit of preparing in the above manner a blue injection, by mixing solutions of persulphate of iron and yellow prussiate of potass. The size coloured in this way possesses indeed a good penetrating property; and the prussian blue which is formed is suspended in the fluid in a state of extremely fine division. For the formation of this precipitate, the solutions may be prepared as follows:—

a. ℥iij. ʒj. (1500 grs.) of protosulphate of iron dissolved in 20 to 25 ounces of water are converted into the persulphate, by the addition of ʒiv. grs. xlv. (285 grs.) of sulphuric acid, of density 1850, and the requisite amount of nitric acid, aided by a moderate temperature; water is then added till the mixture amounts to ℥xl.

b. ℥iij. ʒvi. grs. xlv. (1845 grs.) of yellow prussiate of potass are next dissolved in water, till the solution amounts to ℥lxxx.

For making the injection there are employed—

1 measure of the solution *a.*
2 measures of the solution *b.*
2 measures of the concentrated size solution.

A curious circumstance connected with the employment of this injection is, that the chemical action of the soda contained in the blood causes more or less decomposition, and consequent decoloration of the Prussian blue in the minute vessels. But if the injected preparation be placed in an acid solution,—and for this purpose, according to circumstances, diluted sulphuric, acetic, or tartaric acid may be employed,—the original blue colour is restored. A small quantity of tartaric acid, sufficient to neutralise the carbonate of soda in the blood, may also be added to the above mixture.

No less penetrating and more easily prepared than the former mixture is the

[1] The yellow chromate of commerce, which is often used for injections, is ill adapted for the purpose, its great specific gravity causing it to subside rapidly in the suspending fluid. Doyère (*Comptes Rendus*, 1851, Juillet 12) first recommended the successive injection of solutions of acetate of lead and of chromate of potass, and the consequent formation of the chromate of lead within the vessels themselves; but although by this procedure the finest vessels are injected, they never remain properly or uniformly filled, for the precipitate does not take place regularly, but forms in knots.

apparent[1] solution of Prussian blue in oxalic acid. This, moreover, has not the disadvantage of becoming decolorised by contact with the soda constituents of the blood. The best proportions I find to be—

1 part of Prussian (Berlin) blue.
1 part of oxalic acid.
12 parts of water.
12 parts of concentrated size solution.

The oxalic acid is first finely triturated in a mortar, and the Prussian blue afterwards added to it. Water is then added in successive small portions, trituration being continued diligently till the solid particles totally disappear; the coloured fluid is then added to the warm size solution.

Red Injection.

Of precipitates used for making red injection, there may be mentioned,—freshly prepared golden sulphuret of antimony; basic chromate of lead, obtained by treating the yellow chromate (see p. 249) with caustic potass; and deutoioduret of mercury.

As for the first of these substances, its fine state of division, when first precipitated in the fluid, renders it an excellent material; but the sulphureted hydrogen gas which it always contains destroys the copper syringe.

Basic chromate of lead has a very lively colour, but is too coarse-grained and heavy for fine injections.

Deutoioduret of mercury is rather better adapted for this purpose. To colour an injection with this substance, proceed as follows:—

a. ℥j. ʒv. ℈j. (800 grs.) of corrosive sublimate are dissolved in water, and the measure should amount to ℥xxii.

b. ℥ij. (960 grs.) of iodide of potassium are dissolved in water, so as to make a solution of ℥iiij.

In making the injection fluid, mix—

4 measures of solution *a*.
1 measure of solution *b*.
4 measures of concentrated size solution.

Although this mixture is of a very pure colour, and penetrates tolerably well, it has the disadvantageous property of losing its colour in the minuter vessels, and becoming yellow. This tendency to discoloration is so strong, that if the smallest quantity of glue be present in the glass vessel in which the (saline ?) solutions are mixed, the precipitate formed is not red, but yellow.

None of these mixtures, therefore, deserve unqualified approval; and in most cases preference should be given to other powdered colours, such as *carmine, vermilion*, or *golden sulphuret of antimony*, well washed and dried.

The first of these three substances would be probably most generally useful, were its high price not a bar to its employment. Of the other two, the vermilion has the more lively colour; but, on the other hand, the golden sulphuret is lighter, and consequently better adapted for injecting the minutest vessels.

In using such coloured powders, it is above all necessary to divide them as finely as possible. For this purpose, they should first be levigated in a mortar, and the finest particles decanted off. To do this, part of the water to be used in the injection may be employed. For example, take one part of Chinese vermilion, and mix it with eight parts of water; let the mixture stand for a few seconds in a glass jar, till about one third of the vermilion has subsided, then decant off the supernatant stratum, and mix it with eight parts of concentrated size solution.

With *golden sulphuret* the same procedure may be followed; but as this powder is lighter than the vermilion, a smaller quantity,—say 1 part to 12 of water and 12 of size solution,—is required.

[1] That the solution is only apparent—although the microscope does not exhibit distinct molecules in the fluid—is shown, both by a good filter, which enables us to separate the colouring matter from the fluid, and by the circumstance, that after some time the blue colour falls to the bottom of the solution.

These injections should be well stirred immediately before being used; and in charging the syringe with them, care should be taken to hold its nozzle but a short way below the surface of the fluid, in order that only the finer coloured particles may be sucked up.

White Injection.

Of the great variety of white precipitates formed by double decomposition, I have not yet succeeded in finding one which unites in itself all the requisites of a good colouring material for very fine injections. Of the many which I have carefully tried, and of which, for brevity's sake, I shall say nothing, *precipitated carbonate of lead* has alone given moderately satisfactory results. The proportions recommended are as follows:—

a. ℥iv. ʒj. grs. xx. (2000 grs.) of acetate of lead dissolved in water, making a ℥xvi. mixture.

b. ℥iij. ʒj. gr. xx. (1520 grs.) of carbonate of soda dissolved in water, and forming a ℥xvi. mixture.

The injection material should consist of—

1 measure of solution *a*.
1 measure of solution *b*.
2 measures of strong size solution.

This material is more penetrating than that formed by simply mixing size with white lead. In some injections a mixture containing oxide of zinc has been more successful. The proportions used are the same as those recommended for golden sulphuret of antimony.

Of all the injections above-mentioned, the first—the size solution, coloured with precipitated neutral chromate of potass—deserves a decided preference. In fact, it unites in itself, and in a high degree, all the properties of a good injecting material, easy penetrating quality, uniform cohesion of the coloured particles, and a lively well-marked colour, contrasting well, when viewed by reflected light, with the darker parts of the field of view. When one's choice is free, and a single colour only is required, this is the one most to be recommended.

In the second rank, I am inclined to place the solution of Prussian blue in oxalic acid (see p. 249). True, it is not less penetrating than the yellow, but vessels filled with blue injection are well exhibited only when viewed by transmitted light, or by light reflected from a white ground; and when many such vessels are grouped together, it is the more difficult to separate them the clearer the colour with which they are injected; for single twigs of a blue colour do not form the necessary contrast with the larger and darker arteries. There are, however, cases in which the transparency of the above-mentioned blue injection constitutes its special advantage, especially in the course of investigations for which high magnifying powers are required. Thus, for example, it deserves to be preferred in injecting the capillary system of the lungs,—a structure which can be far more distinctly made out after injecting the blue material and then inflating and drying the lungs, than by using any other injection.

When two colours are required for filling both the arterial and venous ramifications, it is, for reasons already given, in general not expedient to choose *blue* for one of them. Yellow and red are the best colours, as both may be seen by reflected light, and they generally contrast sufficiently. White and red would naturally succeed as well, if the white had the same penetrating property as the yellow. Finally, for some purposes—as, for example, when the two venous systems of the liver, together with the branches of the hepatic artery and bile-ducts, are to be injected—three or four different colours are requisite. In such cases, the rule should be observed to select the least penetrating injection for filling the system whose capillaries are known to be the widest,—as, for instance, the branches of the vena hepatica in the liver.

There are, besides, a few other directions which should be kept in view, when

making injected preparations, and which, in concluding this section, may be briefly given :—

1. Before commencing the injection of an animal or of an organ, a proper plan must be formed, for which a knowledge of the course and relations of the blood-vessels is, of course, absolutely indispensable. Guided by this, and knowing that when the injection is thrown in a suitable direction, it may find its way side-wards through an anastomosing vessel to an organ, which for the moment it is wished not to inject, care must be taken, as a preliminary, to place ligatures on such vessels. When a highly penetrating injection is used, more extreme precautions must be adopted, suggested by the reflection that the fluid, after passing through the capillaries, may be returned from the great vessels to which these lead.[1]

2. The injection of young and lean subjects always succeeds better than that of old and fat ones; and the most suitable period for the process is by no means that which immediately succeeds death, but some time later, when the general stiffening of parts has given place to some degree of flaccidity. This period always arrives sooner or later, and is especially influenced by the temperature of the surrounding air; in summer, injections may be undertaken with advantage a few hours, or the next day, after the death of the subject; while in winter they may be postponed for four days, or even for a longer time.

3. Injection by the arteries is, in consequence of the comparative strength of their tunics, always the most convenient and sure. Consequently, when the sole object is to fill the capillary system with injection, this is always better done through the arteries than through the more tender veins. Besides, these are in most organs provided with valves, rendering the injection of the capillaries through them impossible. But where these valves are wanting, as in the veins of the intestines, injection may be thrown into both classes of vessels successively, which is indispensable in order to exhibit the secondary (and yet microscopic) plexus of arteries and veins, in which the common capillary network takes its origin. In making these venous injections, care must be taken, before fixing the nozzle in the vessel, to remove the coagulated blood, which is often present, by pressing it gently outwards with the handle of a scalpel. When the organ is obviously very full of blood, it is sometimes even advisable to throw warm water into the arteries, till it returns by the veins and brings the blood along with it. But recourse should only be had to these injections of water, when their necessity is quite apparent; for the smaller vessels always suffer from them, so that extravasation is afterwards apt to take place.

4. When the nozzles are properly placed in the vessels, and secured by means of threads, which may be passed round each vessel with a curved needle, the preparation to be injected should be placed in water between the temperature of 97° and 104° Fahrenheit, and the injection deferred till the heat has sufficiently penetrated to the inmost parts of the preparation.

5. The injecting material should be brought to a temperature at which it is sufficiently fluid. This degree of heat may always exceed that of the water-bath in which the preparation is placed, but must not amount to 140° Fahrenheit, at which temperature albumen coagulates.

6. In filling the syringe, by sucking up the injection, care must be taken to exclude all air, which may be best done by forcing the piston home against the bottom of the syringe before putting its extremity under the surface of the fluid.

7. After connecting the charged syringe with the nozzle, slow and gentle pressure must be made upon the piston. If strong resistance is encountered, this

[1] The following illustration may show that such precaution is by no means superfluous :—In injecting the hind foot of a rabbit, through the crural artery, with the yellow fluid whose composition has been above given, the capillaries of a considerable portion of the intestines, and even of the liver, were filled with injection which flowed back from the capillaries and veins of the foot.

may be accounted for by obstruction of the nozzle, and the syringe being withdrawn, the nozzle may be cleared of the impediment by moving a wire or hog's bristle backwards and forwards within it. Further, let the syringe be held in the direction in which the fluid may be most easily ejected,—that is, in the direction in which the current of blood has flowed during life.

8. It is difficult to lay down defined rules as to the time during which the process of injection may be kept up. In fact, it requires some experience to hit exactly the moment for discontinuing the injection; and as the most practised hand may fail, it is necessary to ascertain, sooner or later, whether the vessels are insufficiently filled in consequence of the too early discontinuance of the injection, or whether, from too long perseverance, the operator has not ruptured the walls of the finer vessels, permitting the escape of injection and extravasation into the tissues.

When such fluid and penetrating injections as we have above described are employed, it is in general not advisable to persist in injecting when strong resistance is felt, for in such circumstances extravasation has in all probability occurred. It is, consequently, better to attend only to the outward progress of the injection; for example, in injecting by the carotid artery, to the colouration of the lips, of the conjunctiva, &c. If an injection thrown into an artery is observed to return through the veins, it is of course to be understood that the process of injecting should be discontinued.

9. After every injection, the vessel in which the nozzle is fixed should be tied, or the nozzle itself closed with a cork, to prevent regurgitation of the fluid. When the whole process is completed, the injected specimen should be well washed with cold water, and then placed in weak spirit, in which it should be permitted to lie for some hours, or till next day, before being further examined.

As for the examination of injected organs, it may be said in general that the distribution of the capillary system, its arrangements and relations to other parts and tissues, are exhibited only while the preparation is wet. Drying crumples up all the parts, so that vessels, which originally lay in layers of two or three deep, all appear, when dry, on the same level. On the other hand, drying has the advantage that the preparation may be afterwards put up in turpentine or Canada balsam, which, by rendering the surrounding tissues clear and transparent, permits certain peculiarities of vascular arrangement to be seen far better than is possible in wet specimens. It is consequently for the most part best to examine preparations both in the moist and dry state. The choice of methods is, moreover, somewhat circumscribed by the nature of the organ to be examined. In the case of the liver, kidney, &c., the vascular distribution both on the surface and in the deeper parts may be studied by means of dried sections, without danger of the observer being misled in consequence of the circumstance above-noticed; in other organs, again, a most inaccurate idea of structure is obtained from dried preparations; thus the mucous membrane of the stomach and intestines, with its villi, rugæ, and glands, becomes, on drying, so altered, that one acquainted with it only from examining such specimens, would of course possess a most inadequate knowledge of its true structure.[1]—*Harting, in* "*Het Mikroskoop*," vol. ii., pp. 171-191.

[1] A great part of the plates in the well-known work of Berres, "Anatomie der Mikroskopischen Gebilde des Menschlichen Körpers," though admirable as works of art, have been copied from dry preparations, and are consequently quite useless. But one who has examined fresh preparations of the same parts, is in some degree enabled to find the clue to these labyrinths of vessels.

MEDICINE.

PECULIAR APPEARANCE OF THE TONGUE IN MALARIAL DISEASES. BY DR OSBORNE.

Dr Osborne remarks that his attention has long been directed to a peculiar condition in the tongue of patients labouring under miasmatic diseases. It is an essential departure from the normal aspect of the edge, constituting a distinct lateral boundary of the tongue occupying more or less surface according to the charge of infection in the system. Ordinarily the colour amounts only to a very faint bluish tinge, which is liable to be lost or merged in the various tints imparted to the tongue by various diseases. The most fixed condition of this symptom is an appearance of indentation or crimpling transversely, which is apparently confined to the subjacent tissue,—while the superficial tegument is moist, smooth, and transparent. In a word, it seems to be a continuation or encroachment of the inferior surface upon the superior and lateral borders of the tongue, greater as we approach the root of that organ. The author states that the fidelity of this symptom to the source of its origin is, under all circumstances, fully equal to the importance he has attached to it. In a considerable number of cases of the different forms of dropsy, neuralgia, and inflammation, it has alone enabled him to reach a correct diagnosis when every symptom seemed to deny the agency of malaria in the case. Wherever seen, he has invariably assumed that there existed a tendency to intermittent disease; and upon watching the progress of the case, has as invariably detected this condition. In numerous cases of pulmonary inflammation, where the fever seemed continued, the cough unabated, the oppressive restoration persistent, and the pulse unvarying in its activity, the physical signs have designated with great accuracy the periods of repose and excitement in the course of the disease. In the gastric and intestinal phlogoses again, whether as causes or consequences of fever, if this peculiar impression is seen upon the tongue, he boldly states that no apprehension need be felt in the administration of quinine, however malignant the case may appear. Here also intermission, varying in degree according to the severity of the disease, is always present, and, generally speaking, the shorter the period of repose the greater the quantity of medicine required; and *vice versa*. He has not hesitated, in many cases where the disease was marching rapidly to a fatal termination, to prescribe one, two, and even three drachms of sulphate of quinine at a dose, to be repeated according to the urgency of the indications.—*Western Journal, U.S., and Prov. Med. and Surg. Journal.*

ANEURISM OF THE THORACIC AORTA SIMULATING CHRONIC LARYNGITIS. BY WILLIAM HENRY GOOCH, M.D.

The subjoined case was read to the East Kent and Canterbury Medical Society, and is an instructive example of aneurism of the arch of the aorta, which was not discovered during life, but produced symptoms resembling those of chronic laryngitis.

A carpenter, married, aged 44, of strumous habit, middle sized, and temperate, was admitted September 20th, 1850, into the Kent and Canterbury Hospital. It appeared that about a twelvemonth previously he fell from the top of a house, and soon afterwards spit a little blood; the hæmorrhage, however, did not return. Four months afterwards, he began to complain of a sense of fulness and tenderness about the upper part of the windpipe, which he attributed to a neglected cold, as he coughed a little at the time. Nothing was done for the relief of these symptoms for three months. He was then blistered, the medical attendant regarding his complaint as inflammation of the chest. No relief ensuing, he sought admission into the hospital. He was then reserved and dejected, and much wasted. He complained chiefly of a sense of obstruction behind the thyroid cartilage, with tenderness and soreness in that situation when he spoke or coughed. The cough was hoarse, and often shrill, and at the end of each fit of coughing the breathing became extremely hurried, es-

pecially at night, so that he could sleep but little, His voice was hoarse, and sometimes whispering, and he expectorated a scanty frothy mucous.

Auscultation disclosed a feeble respiratory murmur throughout the *left lung*, particularly at its apex, without rhonchus. The vocal resonance was morbidly loud, and the sound on percussion dull anteriorly and posteriorly. In the *right lung*, with the exception of a little sibilous rhonchus in the upper lobe, the sounds heard by the stethoscope, and percussion, were natural. The systole of the heart was feeble, but the sounds and rythm were healthy. No unnatural arterial pulsation was discovered anywhere. The pulse was 84, soft, and weak. The appetite was impaired, but the tongue looked clean.

Considerable relief was afforded by cupping in the inter-scapular region, by counter-irritation on each side of the larynx, and by mercurials, with expectorants and sedatives. Dyspnœa was alleviated, and sleep secured, by a nightly dose of chloroform. Slight œdema of the ankles now appeared, but with that exception the patient had improved and gained strength, from a nutritious diet and cod-liver oil, when, soon after midnight of the 23d of November, he was seized with a sudden and very violent fit of coughing, during which an enormous quantity of blood rushed from his mouth, and he was dead in an instant. A slight aggravation of the cough had been noticed for a few days before the awful event.

Post-mortem examination on the second day after death.—The larynx and trachea showed no marks of disease. The *right lung* was emphysematous, and did not collapse when the chest was opened. The lung at its upper part was adherent to the costal pleura by long bands of lymph, both anteriorly and posteriorly. Several large red patches were scattered over the surface of the middle and lower lobe, which condition was thought to depend on the entrance of blood into the minute divisions of the air tubes, several small coagula being found in the larger bronchi. The *left lung* was universally adherent by a thick firm layer of lymph, and did not crepitate, the whole of its tissue from apex to base being in a state of gray hepatisation. Three or four cretaceous deposits were found, of the size of half a gray pea, on making sections of the lung. The bronchial ramifications appeared dilated, and their lining membrane thickened, and intensely injected. The pericardium contained the usual quantity of fluid, and presented some white fibrinous patches on the surface of the right ventricle, together with adhesions between the surfaces at the base, around the great vessels. The heart was somewhat large, but its cavities and valves were natural. The aorta presented in its first portion patches of white thickening of the inner coat, and atheromatous deposits, and at more than one spot a circumscribed superficial dilatation of the coats had taken place. Immediately beyond the left subclavian artery there appeared a large opening, that would readily admit the fore-finger, which communicated with an *aneurism*, of the size of a small orange ; it was situated between the aorta and trachea, and contained a small loose mass of fibrin, but had no concentric laminæ. The rings of the lower part of the trachea were bare in the posterior wall of the sac, for a space equal to the circumference of a sixpence. At this spot there were two distinct openings that passed into the trachea at its bifurcation, one of these, more properly speaking, led into the commencement of the right bronchus. The margins of these openings on the tracheal side were surrounded with tufts of lymph, adhering pretty firmly. The left recurrent nerve, after passing round the corresponding bronchus, became embedded in the wall of the aneurism. The glands between the bronchi were much enlarged, and filled with a hard cretaceous substance.

In reflecting on the case now detailed, one cannot fail to be struck with the undoubted relief afforded by the treatment to the more urgent symptoms, at the same time that the aneurismal disease must be considered to have been advancing. To the congested and hepatized condition of the lungs diagnosticated during life, and discovered after death, we may point as satisfactorily explaining this apparent anomaly.

But the great practical lesson which the case suggests has reference to diagnosis; fresh proof is afforded by it of the obscurity which surrounds the progress of aneurisms about the commencement of the aortic arch. In the majority of instances, the symptoms that result from compression of the surrounding organs, offer only equivocal evidence; it remains for a pulsating tumour, or a sudden arterial hæmorrhage, to reveal the true nature of the affection. Sometimes, indeed, the trachea, the œsophagus, or the recurrent nerve, sustain such impediments to their functions from pressure, that the diagnosis is not a matter of difficulty. On the other hand may be cited, as a striking contrast, the case recorded by Mr Lawrence in the "Medico-Chirurgical Transactions," vol. 6, where an aneurism of the arch of the aorta so pressed on the trachea as to ulcerate its lining membrane, and yet the patient did not experience any dyspnœa, death arose from a different cause, and the discovery of the aneurism, which was small and filled with firm laminated coagula, was quite accidental.

Laennec, when speaking of aneurism of the thoracic aorta, remarks :—"It cannot be known with certainty till it shows itself externally; it can hardly be suspected even when it compresses some important organ, and greatly deranges its functions."

And in support of the same doctrine, the case of the late Mr Liston may be adduced. At first, it will be remembered, his symptoms were attributed to tubercular condensation of the superior lobe of the lungs. It was thought doubtful whether the dyspnœa depended on enlargement of the bronchial glands, or on aneurism; the latter was only suspected by the distinguished physicians in attendance. This suspicion proved to be correct, for a false aneurism of the aorta was found of the size of an orange, which had burst into the trachea, and, of course, had led to the copious hæmoptysis that took place five months before death.

In the Catalogues of the Museum of the Royal College of Surgeons, and of St Bartholomew's Hospital, three cases of aneurism pressing on the trachea are described, in two of which an opening was made into the trachea to relieve the symptoms.

In the instance under consideration, the absence of all physical signs indicative of disease of the heart or its large vessels, the evidence of solidification in the left lung, the peculiar character of the voice and cough, with other symptoms, led to the inference that the chief lesion was strumous largyngitis, probably advanced to the ulcerative stage (with pre-existent pneumonia.)

Post-mortem examination corrected the error by discovering another and an adequate cause of the affection of the throat, in the fact of the recurrent nerve being involved in the aneurismal sac; while the condition of the left lung, and the position of the aneurism, explained the paroxysms of difficult breathing.

It is right to add, that a suspicion of some unusual pressure upon the recurrent nerve, like that which would be caused by enlarged bronchial glands, had been expressed by me shortly before the patient's decease.—*Prov. M. & S. Journal,* Feb. 18, 1852.

ON THE TREATMENT OF HOOPING-COUGH BY THE APPLICATION OF NITRATE OF SILVER TO THE LARYNX. BY M. JOUBERT OF CHERION.

The practice of applying solution of nitrate of silver to the larynx by means of the sponge, probably first recommended by Dr Eben Watson of Glasgow ("Monthly Journal," 1849, p. 1287), has been followed by many instances in France with good results, but has seldom been tried on a sufficiently large scale to warrant positive conclusions as to its value. M. Joubert has offered an important contribution towards supplying this deficiency. He adopts this practice not upon the theory of modifying the spasmodic element of the disease by an impression on the laryngeal nerves, but simply with the intention of diminishing the secretion of mucus, to which he attributes the convulsive cough. M. Joubert follows nearly the same plan as Dr Watson, but he uses four different strengths of nitrate of silver solution (from 1 to 4 parts in 30 of water),

and he uses the more or less concentrated liquid according to the amount of mucus, as indicated by the amount of the moist râles.

The numerical results obtained by M. Joubert are the following:—Of 109 cases, 11 were treated by emollients, or by tincture of ipecacuan, or by sedatives (powdered root of belladonna). Mean duration of the cases, 45 days. The 98 others were treated by the cauterisations; but from this number must be deducted 30, in which the cauterisations were not regularly performed. There remain, therefore, 68 cases, which the author divides into three series—1st, Those in which this treatment was begun in the two first days of the second or convulsive period of the disease; 2d, Those when it was begun between the second and eighth day of this period; 3d, Those when it was begun between the eighth and fifteenth day.

Of the first series (40 cases), 37 were cured—viz., 17 in an interval of from 4 to 8 days (*i. e.*, the convulsive period was brought to an end), and with from 3 to 8 cauterisations; 8 from the 8th to the 15th day, with from 8 to 16 applications; 12 from the 15th to the 28th day, with 13 to 24 applications.

Of the second series (16 cases), 15 were cured. The second period of the disease lasted, in 8 cases, from 8 to 14 days, with from 3 to 8 applications; in 4 cases, from 18 to 24 days, with from 8 to 15 applications; in 3 cases, from 18 to 20 days, with 15 to 21 applications.

Of the third series (12 cases), 9 were cured—the convulsive period of the disease lasting, in 4 cases, from 13 to 21 days, with 3 to 8 cauterisations; in 5 cases, from 18 to 25 days, with 8 to 12 cauterisations.

On the whole, in 40 cases the cauterisations produced a rapid cure, and in 20 a very evident diminution in the intensity of the symptoms and the duration of the disease; in 8 cases only, the remedy produced no effect. Of these 40 cases, 7 had relapses. It was between the 5th and the 12th days of the second period of the disease, that the application of the nitrate of silver has been most tardy in modifying the intensity and progress of the disease.—*Recueil des Trav. de la Soc. Med. d'Indre et Loire*, 1851, in *Bulletin de Thérapeutique*, January 1852.

SURGERY.

AMPUTATION AT THE HIP-JOINT. BY J. F. MAY, M.D., PROFESSOR OF SURGERY, WASHINGTON.

In the early part of November 1850, I was requested by Dr Morgan of this city, to visit Richard Eaton, who, he informed me, had been bed-ridden for many months, from disease of the os femoris and knee-joint. After examining the limb, I advised that he should be removed to the Washington Infirmary, for the purpose of having it amputated, to which he consented, and the following is an abstract of his case:—Richard Eaton, aged 37, fisherman, entered the Washington Infirmary on the 5th of November 1850. In August 1847, while on a fishing excursion down the river, discovered a small lump about the size of a filbert below the right knee. The swelling was accompanied with much pain, and continued to increase, until the entire joint and contiguous parts of the thigh were very much enlarged. In March 1850, it suppurated, and discharged very freely, which gave him some slight relief, but in the month of May he was obliged to confine himself to his bed, from which he has not arisen since that period. At this time there are as many as four deep sinuses extending down to the shaft of the bone, and opening by fungoid orifices on the thigh. The thigh is throughout enormously enlarged, *to at least twice its natural size*, and is œdematous up to the groin, and very much inflamed in its middle and superior portion. The knee-joint has long since been destroyed by ulceration, to such an extent, that the foot falls on either side, unless supported. The discharge of pus from the different sinuses and the joint is very great (at a moderate computation at least half a pint

a-day), and the part presents a most disgusting aspect, from the free generation of maggots in the limb and joint. His pulse is now 106. He has burning in the hands and soles of the feet regularly as evening approaches. He had an attack of diarrhœa in July last, which was very severe, and lasted fourteen days. Since that time he has not been troubled with it. His digestive organs are now in a tolerably good condition, notwithstanding that he takes from three to six tea-spoonfuls of laudanum every night before he can get any rest. With the exception of the diseased limb, his whole frame is very much emaciated, and in appearance he is anæmic. He has a bed-sore over the sacrum about as large as a twenty-five cent piece, deep, and for several inches around it the integument presents an angry and livid colour. In his habits he has always been temperate. A nutritious diet, principally of animal food, was ordered for him, and a powder containing sulphate of quinine, carbonate of ammonia, and camphor, to be taken three times a-day in a tablespoonful of brandy. At night tinct. opii ℨiij. to compose and relieve him. I did not of course think it prudent to stop, although I diminished the opiate, to which he had been so long accustomed. His stomach revolting at the carb. ammoniæ and camphor, they were discontinued in a few days, and five grains of the sesquioxide of iron given with the quinine, and brandy. The bed-sore was dressed with the cerat. zinci carb., and pressure removed from it by a circular cushion, and he was placed on an air bed. This treatment was continued until the 14th of November, when his condition having slightly improved, I decided on removing the thigh at the hip-joint, for the following reasons:—1st, The soft parts are diseased to such an extent that it is impossible to get a proper covering for the bone, except in its upper portion, and even here, and as high up as the groin, the tissues are enfeebled and œdematous; 2d, The shaft of the femur can be detected in a very diseased state high up, and I believe from this fact, in connection with the state of the soft parts, and the long duration of the disease, that the cancellated structure of the entire bone is involved, and my colleagues concur with me in this opinion. The patient, aware that he could live but for a few weeks, was perfectly willing to submit to the operation, though told that he might, in his debilitated condition, die on the table. The operation was performed on the 14th of November, in the presence of the medical class and a number of professional gentleman, in the following way:—The patient in a state of complete anæsthesia from chloric ether, was brought into the amphitheatre, and laid on a narrow table, the nates projecting well over its edge. The artery was compressed by an assistant with the thumb against the pubis. The limb (which from its size required to be supported by two assistants) was then slightly raised, and flexed upon the pelvis, so as to relax the muscles on the anterior and upper part of the thigh. The testicles being drawn well upwards out of the way, and the sound limb to the opposite side, a long and narrow one-edged knife nearly twelve inches in the blade was then introduced, a little above the *tuberosity* of the *ischium*, carried as near the neck of the bone as possible, and pushed out on the opposite side, about one inch and a half below the *anterior superior spinous process of the ilium*. A flap between six and seven inches long was now cut downwards from the front of the thigh. The knife was of course passed much beneath the femoral vessels, and they were consequently not divided until the lower edge of the flap was being cut; this enabled an assistant to pass his hand into the upper part of the incision at the back of the knife, and thus to grasp and securely compress the femoral artery *before* it was divided by the passage of the knife downwards. This flap was now raised and drawn forcibly upwards by the same assistant, the femoral artery being still so securely held by him that scarcely a drop of blood escaped from it or its branches. To prevent the fingers from slipping, a soft piece of rag was held against the cut surface. The thigh was now abducted and forcibly depressed by the two assistants having charge of it, so as to throw the head of the femur forwards, and from the acetabulum as much as possible, and the knife was carried across the capsular ligament, until it was freely divided. The head of the bone now started from the acetabulum, the round ligament was divided, the knife

passed behind the head, and a posterior flap cut a little longer than the anterior. As soon as the limb was removed, the vessels in the posterior flap were compressed by sponges held against them, until they were separately tied. Ligatures were applied to them first, and then the femoral, the profunda, and smaller branches in the anterior flap were secured. Ligatures were applied in all to twelve arteries.

Hæmorrhage having been completely arrested, the edges of the flaps, on account of their great size and weight, were approximated by four points of the twisted suture, with broad adhesive strips in the intermediate spaces, and water-dressing was applied over the wound. Not more than eight ounces of blood were lost in the operation.

The operation itself was performed in half a minute; and I was most ably assisted in it by my colleagues, Professors Miller, Johnston, and Stone, and Drs Wotherspoon and Coolidge of the United States Army, to whom my thanks are due for the very important aid which they rendered me.[1]

The patient did not evince the slightest consciousness during the operation, and on being told, when he awoke, that the limb was removed, he expressed great surprise. The wound being dressed, he was removed to his bed, and the simple water-dressing was ordered to be continued, and four teaspoonfuls of tinct. opii were given to him at about half-past three P.M., this being about the usual quantity he was in the habit of taking before he entered the Infirmary, Eight P.M.—Pulse 98; not having been composed by the first dose of laudanum, ʒiij more given.

Nov. 15th.—Slept four or five hours during the night, and feels better; spirits good; pulse 96; took for breakfast tea and toast, and a soft-boiled egg; has been a great smoker before and during all his illness, and asks to be allowed a cigar—granted; at dinner chewed a few mouthfuls of beef-steak, and took some coffee and dry toast; dry toast and tea for supper. Nine P.M.—Pulse 104 to 106. Soft compresses, soaked in warm water, ordered to be applied to wound every few hours, and covered with oiled silk, to prevent too rapid evaporation; bed-sore dressed with the cerat. zinc. carb., and over this adhesive plaster. Ordered tinct. opii ʒiij.

16th.—Slept again about five hours during the night; took coffee, dry toast, and soft-boiled egg for breakfast, and feels better; pulse 90, soft and regular, and skin moist; warm-water dressing continued, and bed-sore dressed as yesterday; at dinner, took a few stewed oysters, with a cup of coffee and dry toast, and smoked a cigar. Eight P.M.—Pulse 88; wound discharging freely; discharge thin, and slightly coloured; took coffee and dry toast for supper. Ordered tinct. opii ʒiij.

17th.—Slept well last night; pulse 88; same dressing to wound and bed-sore continued; took out one of the sutures; took same breakfast as yesterday, and with appetite; wound looks well, and union appears to have taken place in a large portion of it; for dinner, chicken soup and a small piece of boiled chicken, which he desires; has had no passage from his bowels since the operation. Ordered ol. ric. ℥ss., mist. camph. ʒij, aq. menth. q.s. M. ft. haust. Seven P.M.—Has had two healthy-looking evacuations from bowels; urine clear and healthy-looking; pulse 96. Continue iron, brandy, and quinine; at bed-time tinct. opii ʒiij.

[1] Immediately after its removal, the bone was sawed through longitudinally by Professor Stone, and the entire cancellated structure, extending through the trochanters, the neck, and the head, was found to be very much softened (cheesy), and filled with pus. The external table in this, the upper third of the bone, did not seem to be much involved, though below it was much affected; but the cancellous portion was a mass of disease. The cartilages covering the head and lining the acetabulum were smooth and healthy in appearance. The soft parts were infiltrated with serum throughout the whole limb, which continued to ooze from it very freely for many hours after its removal. The muscles were pale and flabby, and in the lower half of the thigh they were blended together and disorganized.

18th.—Has slept well; pulse 96; tongue moist and clean; took same breakfast as yesterday; removed remaining sutures, and applied fresh adhesive strips to sustain the edges of wound; free discharge from it; same dressing continued. Ordered half a pint of oysters for dinner. Eight P.M.—The pulse 86; some pain in stump. Ordered tinct. opii ʒiij.

19th.—Pulse 100; has not slept well, but took his usual breakfast with appetite; discharge from wound free, thin, and brown; same dressings continued. Eight P.M.—Pain in stump. Give ʒiij tinct. opii. Pulse 86; spirits good; had a healthy and natural evacuation from bowels in the afternoon; ate for dinner to-day two roasted Irish potatoes, and a small piece of roasted chicken, and smoked during the day two cigars.

20th.—Has slept some and looks better; pulse 86; took his usual breakfast, only substituting tea for coffee; wound discharges very freely; same dressings to it continued. Ordered for dinner half a pint of stewed oysters, with roasted potatoes, and allowed two cigars during the day. Eight P.M.—Considerable pain in stump; pulse 84. Ordered tinct. opii ʒiij.

21st.—Has passed a bad night, very restless and starting in his sleep; countenance expressive of much suffering; pulse 100; very free thin discharge from wound; four of the ligatures on small vessels in the lower flap came away this morning, and considerable hæmorrhage followed; partially opened the wound, and removed a recent coagulum, and also a quantity of very dark and offensive coagulated blood that had evidently oozed out soon after the operation, probably from the acetabulum, as it lay in contact with it; arrested the bleeding, which was quite free, and proved to be from the ischiatic artery; re-applied water-dressings, and ordered tinct. opii ʒiij. Eight P.M.—Pulse 108; has taken his usual supper, and has a small stool to-day; stump hot. Apply cold water-dressing.

22d.—Has had a good night; pulse 102 to 104; ate his usual breakfast with relish; stopped the brandy to-day, and ordered in its place a wineglassful of London brown stout, with five grains of procotarb. ferri, Vallet's (in place of the sesquioxide and quinine, which he has been taking), three times a-day; half a pint of stewed oysters for dinner, and may smoke his cigars as usual. Eight P.M.—Pulse 102 to 104; easy; took his meals with a good relish to-day, and says he feels better and stronger. Ordered tinct. opii ʒiij., and ʒij. more to be taken in the night if restless and unable to sleep. The additional dose was allowed, because for the two or three nights past he has not been able to sleep as well as usual.

23d.—Slept well after taking the second opiate, being very restless before; discharge from wound more consistent and healthy; allowed for dinner a tender piece of beef-steak and two potatoes, and during the day two cigars. Eight P.M.—Pulse 98; has had a very comfortable day, and is in good spirits. Tinct. opii ʒijss., and a smaller dose to be repeated late if necessary.

The treatment which is here given for the first nine days after the operation was continued with slight variations, for four succeeding weeks. The last ligature came away on the 14th of December. On the 25th he sat up in bed, and on the 29th in a chair, and was wheeled about the room and passage. On the 31st the stump was almost entirely healed, and he was able to sit up a couple of hours at a time, and on the 1st January he moved about the room on crutches for the first time. From this period he improved more rapidly in flesh and strength, and he left the Infirmary on the 26th. On the 17th of February I called at his house, and found that he was out and able to attend to business, in which he is at this time (July 18th) actively employed, and supporting by it a large family. The stump continues to be perfectly sound, and he says that his health is as good as it ever was. In all respects, he presents the appearance of a strong and vigorous man.—*Amer. Jour.* Quoted in *Dublin Medical Press,* January 14, 1852.

TREATMENT OF VARICOCELE BY GUTTA PERCHA DISSOLVED IN CHLOROFORM. BY H. G. CAREY, M.D.

After having used gutta percha considerably for other purposes, a knowledge of its properties forcibly suggested it in solution, as admirably fitted to fulfil the desired objects sought in the treatment of varicocele. In order to apply it, the patient is placed upon his back, and by means of cold, the scrotum is corrugated until it is drawn firmly over the root of the penis, compressing the testes firmly in the upper portion of the inguinal pouches; then, by means of a camel's hair pencil, after the hair has been removed, apply the solution freely over the site of the scrotum, allowing it to extend on all sides some distance by a thin attachment; but over the scrotum proper lay on a succession of coats, until a thickness of a line uniform throughout is obtained, which will be sufficiently strong to form an artificial pouch of the nature and character desired. This thickness will be so yielding and pliable as not to afford the wearer any considerable inconvenience. Soon after the solution is applied to this sensitive part, the patient will complain bitterly of the burning sensation experienced, depending upon the presence of the chloroform; but this temporary inconvenience will soon pass off. The constitutional indications, if there be any, must not, of course, be neglected.—*Western Lancet, U.S., and Prov. Med. and Surg. Journal.*

CASE OF PENETRATING WOUND OF THE HEART. BY DR LANDSBERG, BRESLAU.

A man, 28 years old, received in a scuffle a stab in the breast from a shoemaker's quadrangular awl. Feeling nothing at first, he walked down stairs and across the street to his own dwelling, in the first storey of a house several doors off. A quarter of an hour after, he vomited his last meal, taken about an hour previously, and likewise several doses of ag. cinnam. with ext. opii. One hour after this, the author found him lying in bed, pale and exhausted, with livid areolæ round his eyes, cold nose and ears, pale lips, the extremities alternating between cold and momentary artificially induced heat; in the left radial artery, no pulse; in the right, an occasional very small and rapid pulse; and the same, but somewhat stronger, in the carotids; the pulsation of the heart frequent and feeble; on immediate auscultation, it appeared somewhat undulatory, the beats sliding into one another, and having no exact or harmonious relation to the carotid pulse; percussion dull over the region of the heart; respiration short and quickened; deep inspiration; only occasioned inconsiderable pain in the region of the wound; speech without difficulty; the voice sonorous but feeble; region of the stomach anormally tender and hard. The wound was quadrangular, and about a line in its greatest diameter. It was situated at the inferior edge of the sixth rib, about three inches to the left of the mesian line. Pressure on this spot gave a feeble perception of crepitation. The wound is painless, red, and without discharge. No cough; bloody expectoration; emphysema or feeling of weight in the chest; and decubitus can take place on either side. Tongue warm, moist, and clean; great complaint of internal heat, and desire for cold water; vomiting and syncope gone, but a slight diarrhœa has set in. Mental functions undisturbed. Venesection was had recourse to on the right arm, but the blood flowed very slowly, and drop by drop. An emuls. nit. and perfect quiet were prescribed. In the evening, vomiting and syncope had again recurred, induced apparently by drinking cold water, but were soon allayed. The last trace of a pulse had vanished some hours previously.

Paracentesis thoracis was now performed in the region of the wound, in the hope that perhaps some bleeding vessel might be found and tied, but without avail.

Cold was steadily applied to the breast, and the emulsion continued. The patient was quiet but sleepless; drank much, and vomited occasionally, but without the recurrence of syncope. He remained perfectly conscious till about 4 A.M., when he raised himself in bed once or twice, and began to sing. About 5 A.M.,

after again raising himself up, he fell back dead. The entire duration of the illness was about 16 hours.

Section, 32 hours after death.—On carefully removing the sternum, a quantity of black blood escaped. The internal orifice of the wound was easily distinguished from that made in the operation: it seemed larger than the external opening, lentil-shaped, and tolerably horizonal in direction; the lungs, in their normal position, filling the thoracic cavity, and strongly adhering to its walls; the left lung, particularly its lower lobe, strongly infiltrated with blood, and of an intense black colour; pericardium distended, pouch-like, elastic, and fluctuating to the touch, so finely adhering to the tendinous portion of the diaphragm by means of recent plastic exudation, that the most careful separation could not avoid the bursting open of the wound, and escape of more than a pound weight of thick black blood. The opening into the pericardium took an oval direction from below upwards, and measured 3 to 4 lines, being probably artificially enlarged in separating the adhesions. Heart tolerably large, pale, and flabby. On the left ventricle, near its apex, and one line from the incisura cordis, is a small gaping wound of about a line and a half in length, extending upwards to the right, and through which a probe may be passed more or less deeply in various directions, but without quite passing into the cavity. On opening the heart, the wound was found to have penetrated quite through its walls, but the internal opening, somewhat round and half a line in diameter, was exactly under a trabecula carnea. The large vessels of the chest empty; those of the abdomen contained a tolerable quantity of black blood. In the cerebral cavities, neither watery effusion nor marked anæmia.—B.—*Schmidt's Jahrbücher*, August 1851.

EXTENSIVE LACERATION OF THE LIVER, WHICH THE PATIENT SURVIVED SEVEN WEEKS.

At a late meeting of the Pathological Society of London, Mr William Adams narrated the following case:—

J. W., aged 23, was admitted into St Thomas's Hospital in a state of extreme collapse, having been squeezed between a cart-wheel and a post. He remained without any re-action for nearly forty-eight hours, and then slowly revived, having taken a very large quantity of brandy. Symptoms of peritonitis supervened, and were somewhat relieved by calomel, &c. The abdomen remained swollen, with distinct fluctuation on the right side. Oppression at the chest, with difficulty of breathing, gradually increased, till his death, which took place seven weeks and two days after the accident.

Post-mortem examination.—Right side of the chest more prominent than the left. Abdomen uniformly tense. On opening the chest the right pleural cavity appeared to be filled with turbid serum, tinged with blood, in which was a large quantity of imperfectly coagulated blood, about a quart, coated with fibrin or lymph, tinged with bile. The right lung had evidently suffered extreme compression. This fluid also communicated with fluid in the abdominal cavity, through what at first appeared to be a laceration in the diaphragm; further dissection, however, showed that the fluid in the chest was not in the pleural cavity, but that the diaphragm had been pushed upwards into the chest as high as the upper edge of the third rib anteriorly and laterally, and internally to the interval between the second and third dorsal vertebræ; below the points indicated it was adherent to the thoracic parietes. The right lung was compressed into the apex and posterior part of the thoracic cavity, the anterior margin of its base not extending lower than the interval between the second and third costal cartilages. The substance of the lung was healthy. Continuous with this thoracic extension of the abdominal cavity was a large and imperfectly-circumscribed cavity, occupying nearly the right half of the abdomen, bounded below and towards the mesial line by the great omentum, passing obliquely downwards across the right iliac fossa; in this situation the boundary was imperfect, so that the large cavity above described as occupying the right thoracic and right half of the abdominal regions, communicated with a smaller cavity occupying the pelvis, and extending into the

left iliac region, and also filled with serum, turbid with pus, the pus being most abundant in the iliac region. These cavities were circumscribed by peritoneal adhesions. There had been slight general peritonitis, a small quantity of lymph being diffused over the surface of the intestines, but the adhesions were principally in the neighbourhood of the cavities above described. The liver was lacerated extensively, the injury extending nearly through the centre of the right lobe, the outer portion of which, nearly detached, was displaced upwards, lying over the heads of the sixth, seventh, and eighth ribs; this portion was of a very light yellow colour on the surface, and extremely pale in its interior. The laceration ran parallel for a considerable distance with one of the largest branches of the right hepatic vein, but no branch of the first or second order appeared to have been opened, though the laceration extended almost to the vena cava. The liver was tilted towards the right side, and one margin of the laceration being drawn towards the ribs, contributed to the deceptive appearance of a laceration through the diaphragm. All the other organs were healthy, with the exception of a very slight laceration of the right kidney.—*Provincial Journal*, February 18, 1852.

REMOVAL OF A PORTION OF THE RECTUM.

At a recent meeting of the Pathological Society of London, Dr Beith exhibited, for Mr Dickson, a portion of the rectum, which, having protruded, had been cut off. The person on whom the operation was performed had suffered severely from intermittent fever, and was much debilitated from its effects. While a convalescent, he was attacked with acute dysentery; and during the efforts to relieve the bowels, a prolapse of the rectum occurred. When experiencing insuperable difficulty in its reduction, he requested a non-professional friend, who had called upon him, *to be so obliging as to cut it off*. This request was complied with, to the satisfaction and relief of the sufferer. The bowel removed, when subsequently examined, was found to have been cut off by an irregular and oblique incision,—so that it was of the extent of three inches on one side, and only an inch and a quarter on the other. On a close examination, it was found to be composed of all the tissues of the gut. Urgent symptoms set in on the second day after the removal, when more of the rectum was extruded, and subsequently removed by operation, in consequence of the impossibility of treating it by any other method. The patient subsequently recovered.—*Medical Times and Gazette.*

MIDWIFERY.

PELVIC ABSCESS COMMUNICATING WITH THE RECTUM AND BLADDER, AND OPENING ALSO EXTERNALLY; SUDDENLY FATAL BY ULCERATION INTO THE EXTERNAL ILIAC ARTERY. BY DR ELKINGTON.

E. Wyer, aged 29, was admitted into the Lying-in Hospital, September 10, 1851. She stated that she had been married nine years, and had had one child, which was eight years old. About last Christmas she had an attack of acute rheumatism, to which she had been subject for several years, in the upper and lower extremities. In February, and soon after the rheumatic inflammation had left the extremities, she suffered an attack of pain in the pelvis and hips. This was followed by a purulent discharge from the vagina, but without any permanent relief. She has been in a bad state of health ever since, and suffered almost constant and severe pain. Has had great pain, and at times difficulty, in making water. Lately her urine has escaped every now and then, involuntarily, and has been at times mixed with pus. She is much emaciated; pulse quick and feeble; no hectic. Complains of great pain and tenderness over the lower part of the abdomen, and constant inclination to bear down.

On making an external examination, I found a fulness of the right iliac region, and immediately above Poupart's ligament, and midway between the anterior superior spine of the ilium and pubes, an oval swelling, nearly two

inches long, the integuments covering it being thin, red, and about to ulcerate. There was fluctuation, but the pain on pressure was so great over the whole of the lower part of the abdomen, that it was impossible to make a careful and minute examination.

On making an examination per vaginam, the uterus appeared about its normal size, but was drawn upwards; the vagina relaxed, and its surface, anteriorly, puckered or irregular, and thickened. She gets very little sleep. Ordered Pil. Anod. omni nocte; Mist. Tonic. ter die.; a warm linseed poultice and generous diet. The poor woman became alarmed at her state, and left the hospital on the 12th. She returned, however, on the 15th. She was worse, and the swelling in the groin larger. In the course of the night the abscess broke, and there was a large quantity of very offensive pus discharged. She had previously refused to allow the abscess to be opened. She was directed to lie upon the right side, to facilitate the escape of the pus, to continue the poultice, and her mixture and pill, and to take a pint of porter and two glasses of port wine daily.

On the 21st of September, she was better, had less pain, and less discharge. During the night she got out of bed, and soon after she had lain down again, she called to the nurse, and said she was bleeding, and died almost immediately. The nurse states that she lost a pint of blood in two minutes, and that "it came out like a fountain."

Post-mortem Examination.—A large cyst was found occupying the right half of the pelvis, its outer wall being bounded by the bones of the pelvis. It communicated by a small opening with the bladder, with the cœcum, and with the external opening in the groin. It appears to have had its origin in the ovary. The integuments about the groin were completely separated from the muscles, which were bared to the extent of two or three inches. The external iliac artery, about an inch below the bifurcation of the common iliac, was opened by ulceration, and its coats for some little distance appeared in a sloughy state. The artery was surrounded for some distance by partly-organised lymph, which firmly connected it with the vein; but at the point of ulceration there was no deposit of lymph, nor any attempt at protection or repair.—*Birmingham Path. Society's Proceedings*, in *Provincial Medical and Surgical Journal*, January 21, 1852.

CONGENITAL SMALL-POX IN TWINS.

Dr Ayer was called in haste to Mrs P., and found her in great pain.

On examination, the head of a small fœtus was found born. The uterine contractions were active, and its full delivery effected in a moment, attended by a feeble cry. The pains continued, a bag of fluid was felt protruding, and soon a second fœtus was expelled dead. Two separate placentæ were afterwards removed. The infants were of the size and development of six months. The living one had a dozen or more of pustules on the face, head, and breast; one or two more were noticed on the abdomen, but none on the limbs. Three or four were good-sized, plump, and well-defined pustules of small-pox. The remainder were not so full, but evidently of the same character. This one survived its birth two hours. The dead child had no offensive odour; the abdomen was dark purple, and the cuticle quite loose. Its whole body, especially the abdomen, was marked with depressions, similar to those of variola in infants, after death. No elevations or pustules were noticed: these marks only remained.

Three weeks before the abortion, the mother, I was informed, had broken out with variola after the usual premonitory symptoms, and had just recovered when I saw her. The disease was so mild, that a physician was not called. She could not trace her miscarriage to any over-exertion, or any cause except the attack of varioloid.

Whether the mother infected the twins at the same period, and the death of one caused the expulsion of both; or one had the disease first, and the second received it from him, are questions of some interest, but difficult, from the evidence, to decide.—*Boston Medical and Surgical Journal*, June 18, 1851.

EXTRACTION OF THE CHILD BY A NOVEL PROCESS. BY DR A. E. AMES.

Mrs H. in labour of her tenth child, ill for seven hours, pains very hard, progress slow. First presentation of Baudeloque; previous to labour, the labia had become somewhat swollen, and increased as the labour progressed. There being no prospect of the natural termination of the case, from the unusual size of the head completely filling up the pelvic region, and the application of the forceps being impossible, craniotomy was determined upon. An incision being made through the scalp, two-and-a-half inches in length, two fingers were passed into the wound far enough that, when extension was made, the force would not come against the edges of the incision. The left hand being placed against the perineum, extension was made with the right hand; this had a tendency to elongate the head of the child, and, aided by the pains, which were good from the first, the child was born alive. The wound was simply dressed.—*Charleston Medical Journal*, November 1851, p. 888.

SMALL-POX DURING THE SEVENTH MONTH OF PREGNANCY.—CHILD BORN AT THE FULL TIME.

Dr S. F. Parcher was called recently to attend a young married lady, who had been suffering intense pain for the twenty-four hours previous. He found her with a hot skin, dry red tongue, and high arterial excitement; pulse 110 per minute, full; severe pains in the head and back; and in the seventh month of pregnancy.

Prescribed leeches to the temples, and Hyd. cum Creta and Jalap ā ā gr. x., followed by saline draughts and diaphoretics. In about thirty hours pustules made their appearance, and continued until the case assumed the appearance of genuine small-pox. She passed through the various stages favourab y, and convalesced as rapidly as usual, save a slight ophthalmia, which retarded somewhat the cure; went her full time, and gave birth to a fine, plump, healthy girl, without the least appearance of its having had the disease. Vaccination had no effect upon it. " Query—Can the mother, during the last months of pregnancy, go through with small-pox and not affect the child in utero? If so infected, will there not be unmistakeable evidence upon the skin? Or does exclusion of light and air prevent scarring, and thereby leave a smooth surface?"—*Boston Medical and Surgical Journal*, July 2, 1851.

OF SUDDEN DEATH FOLLOWING DELIVERY.

At a meeting of the Chirurgical Society of Paris, January 7th, 1852, M. Robert introduced the subject of sudden death following deliveries without any apparent cause, the patients being to all appearance in perfect health.

M. Robert gave the case of a young woman, aged 25 years, who, much excited by the political events of the times, went from Paris to Versailles, to be confined of her third child. Two days after her removal, she was safely delivered, and nothing particular followed; her recovery being most satisfactory until the ninth day, when, upon being assisted from her bed, and about to partake of a meal, she suddenly sank down and died.

M. Robert had previously seen two similar cases. One, a young woman, non-primiparous, died on the sixteenth day—another, a woman who had born several children, also died on the sixteenth day. The autopsy in these three cases showed nothing to account for death.

Can these facts be considered as a simple coincidence, or is death determined by the modification which the puerperal state produces in the organisation?

Do post-mortem examinations throw any light on the matter?

M. Danyau replied that these facts are not very rare; he had observed them many times. M. Dubois, M. Morence, and M. Baudeloque, had each seen examples. M. Danyau had attended a lady in the enjoyment of excellent health, her labour was easy, and her recovery excellent; on the twentieth day, he visited her

about 11 A.M., and found her agitated and perplexed; in a short time after which, she passed into an adjoining chamber, and there suddenly died. At the autopsy, no air was found in the veins or heart—the only pathological change worthy of note, was a vascularity of the pericardium, and slight effusion into its cavity. M. Danyau remarked that in all known cases, death had occurred in an equally rapid and unseen manner; this patient was remarkably *embonpoint*. She took little exercise, and experienced oppression in walking, the heart was slightly fatty, a circumstance which had been noticed in England as predisposing to sudden death. Instances have been recorded of two women recently delivered, dying from this cause; but the causes have not been reduced to certainty. Death cannot be attributed to the introduction of air into the uterine veins immediately after delivery, for in that case, death has always supervened rapidly; it is therefore evidently by extreme syncope.

M. Robert had been lately making some observations on the blood of parturient women, and suggested the possibility of the predisposition to this fatal syncope arising from chloro-anæmic state of the blood. M. Danyau, on the contrary, was of opinion that there was no indication of chlorosis in any of the cases he had seen.—*L'Union Medicale*, Jan. 10, 1852.

ON INFLAMMATION OF THE OVARY. BY DR PISTOCCHI.

After narrating several cases of inflammation of the ovary, Dr P. states:—

1st. In reference to semeiotics, that although, in the opinion of many, no pathognomonic and differential signs are presented by this affection, we believe the following may be considered as such:—1. Single or double lateral pain, according as the disease implicates one or both ovaries, spreads along the hips and sides, especially on movement. 2. Metrorrhœa is frequent without a proportionate uterine idiopathic affection. 3. The ovarian functions, as regards concupiscence and fecundity, undergo disturbance. 4. There is a lateral consensus of parts more immediately brought into contact with the ovary, as the breasts, and of the hypochondrial viscera, the kidneys, and possibly of all parts of the same side. Three cases are referred to, in one of which amblyopia, and in the other two sciatica, occurred on the same side. 5. The special liability of the left ovary. 6. The patient, while suffering from disease, is liable to a variety of anomalous and violent anæsthetic and convulsive affections of the nervous system. General febrile action, too, is active, and frequently intermittent.

2d. With regard to etiology, the author believes that the affection is very dependent upon innate original peculiarities, the nervous temperament remarkably prevailing in the subjects of it. Concupiscence prevails in some such individuals in a degree leading to onanism; and even in the absence of actual disease, they are usually sterile. In such individuals any existing cause, which would be inoperative in other persons, may induce Oophoritis. He considers onanism, venereal disease, and repercussed gonorrhœa, as especially likely to induce the affection, though in the predisposed it may occur independently of any of these.

3d. Therapeutics. Treatment of a depleting and contra-stimulant character is required to be energetically put in force. Few diseases tolerate and require such active depletion, pound after pound of blood being abstracted with nothing but advantage. As soon as the more acute symptoms are thus got under, nothing so much aids the cure and prevents relapse, as the employment of cicuta.

The disease being, however, more frequently chronic than acute in its character, may proceed even to the organic destruction of the ovary without its presence being detected; the most extensive change in an organ not necessary to life occurring without inducing general re-action. Dr P. believes that several of the convulsive affections of women, treated as idiopathic nervous affections, are really dependent upon, or at all events intimately connected with, the dynamo-organic affections of the ovary.—*Bulletino delle Sc. Med.*, vol. xvii., pp. 1-81; and *British American Medical and Physical Journal*, Sept. 1851, p. 226.

GASTROTOMY SUCCESSFULLY PERFORMED FOR EXTRA-UTERINE PREGNANCY. BY DRS BRODLEY AND ROGERS.

The patient was a negro woman, æt. twenty-eight years, the mother of seven children. In June 1849, six weeks after conception, she began to complain of colic, attended with constipation; on the 10th of February 1850 she supposed herself in labour; on examination, the os uteri was natural, and the breasts were flabby; there had been no movement of the child felt since the middle of November, at which time there was milk in the breasts. A tumour, filling the whole right lumbar region, extending above the hypochondriac and below the iliac region, and somewhat to the left of the umbilicus; there was also present considerable febrile disturbance. She was certain that she had felt the motions of the child from the fourth or fifth to the seventh or eighth month, when she supposed it died. The diagnosis being extra uterine pregnancy, removal of the child was recommended. On the 7th February 1851, the patient having been previously prepared, chloroform was administered, an incision was made, extending from two inches above the umbilicus to the pubes, a fœtus was found in the right Fallopian tube, fully formed, and about the size of a seven-months child; but little decomposition had taken place. It was firmly attached to the peritoneum, anteriorly and posteriorly, and laterally to the uterus. In separating the attachment, the epidermis of the child was removed. At the adherent portions, after removal, the parts were carefully cleansed, and four sutures, with sufficient adhesive plaster, were used, and an opiate was ordered. Her recovery was rapid; so much so, that four weeks after the operation it was complete.—*N. O. Medical and Surgical Journal; and New York Journal of Medicine* for Sept. 1851, p. 276.

MATERIA MEDICA AND TOXICOLOGY.

NEW TEST FOR MERCURY. BY ARTHUR MORGAN.

The following seems to be a novel and hitherto undescribed method of detecting the salts of mercury, either in substance or solution:—

If a strong solution of iodide of potassium be added to a minute portion of any of the salts of mercury placed on a clean bright plate of copper, the mercury is immediately deposited in the metallic state, appearing as a silvery stain on the copper, which cannot be mistaken, as no other metal is deposited by the same means.

By this method, corrosive sublimate may be detected in a drop of solution, unaffected either by caustic potash or iodide of potassium. In a mixture of calomel and sugar, in the proportion of one grain to two hundred, a distinct metallic stain will be obtained with one grain, which, of course, contains 1-200th of a grain of calomel; in like manner, 1-400th of a grain of peroxide of mercury may be detected, although the mixture with sugar is not in the least coloured by it.

With the preparations of mercury in the undiluted state, this process acts with remarkable accuracy, the smallest possible quantity of calomel or peroxide of mercury, such as would almost require a magnifying lens to perceive, placed on copper, and treated with iodide of potassium, will give a distinct metallic stain.

The advantages of this test may be briefly stated as follows:—1st, It is a delicate test, inferior only to chloride of zinc and the galvanic test of zinc and gold. 2d, It is easy of application. 3d, It requires a very small portion of the substance to be examined—a matter of no small import. 4th, Acting on the insoluble as well as the soluble salts, it obviates the intermediate process of solution. 5th, When it acts, its indications are decisive.

As to the disadvantages, the only one which seems tenable is, that although it acts on minute portions, still that must be in a concentrated condition. For instance, though we may detect the 1-1000th of a grain of corrosive sublimate in a drop of water, we cannot detect it in a drachm, but this may, of course, be remedied by evaporation.

Now, with regard to the theory of this process, the following seems most satisfactory,—that the iodide of potassium forms a soluble and easily decomposed salt with the various salts of mercury,—that is, an iodide soluble in excess of the iodide of potassium.—*Dublin Medical Press, December* 24, 1851, *and Provincial Medical and Surgical Journal,* January 21, 1852.

EXAMINATION OF THE SEED AND CAPSULES OF DIGITALIS PURPUREA.
BY DR A. BUCHNER, SEN.

The author has examined the seed and capsules of Digitalis purpurea. The seed lost by drying, at about 162° F., 9.26 per cent. of water. The capsules are very slightly hygroscopic, and lose scarcely four per cent. by drying. The author prepared extracts of the seed and of the capsules with æther and water, and examined them. The following are the results arrived at:—

The seeds of Digitalis purpurea are preferable to the leaves, as they contain a larger amount of digitaline together with a fat oil, are not so liable to be mistaken or collected at a wrong period, and are more easily dried and preserved without experiencing any alteration; in short, more dependence can be placed upon them.

The digitaline in the oily compound, which is easily prepared with æther from the seed, merits every attention in a therapeutical respect, for the seed, or the oily digitaline compound from it, can be easily dispensed, and at a very moderate expense, in various forms, as emulsion, powder, pills, &c.

The seed-capsules and calyx of Digitalis likewise contain digitaline, but in proportionately far smaller quantity; so that the tannate of digitaline, which can be prepared from the aqueous extracts, is respectively as 3.00 and 0.33 per cent. of the weight of the seed and capsules.

This quantity, separated from the seed by exhaustion with boiling water, does not form the entire amount of digitaline; for, like resinous substances, it is not only soluble in alcohol, but also in oils, and it is partially combined with the fat oil of the seed.

The oil containing the digitaline, which can be extracted by æther, amounts to about forty per cent. of the weight of the seed; it belongs to the siccative oils. Æther extracts, besides the oil, another more resinous digitaline compound, which sinks in water, while the oil floats on the top. A portion of the digitaline compound can be removed from the oil by water.

The tannate of digitaline is soluble in hot water; on cooling, it again separates for the greater part.

Digitaline prevents the fermentation of an aqueous solution of sugar; it must, therefore, be considered as a poison to beer-yeast.—*Buchner's Repert.*, ix. p. 38; *and Chemical Gazette,* February 2, 1852.

ON THE PREPARATION OF CAFFEINE. BY H. J. VERSMANN.

The author mixes the powder of 10 lbs. of coffee with 2 lbs. of caustic lime, which is previously converted into hydrate by being sprinkled with water. The mixture is placed in a displacement apparatus, and exhausted with alcohol of 0·863 until a sample of the liquid which passes no longer shows the presence of caffeine on evaporation. As coffee is exceedingly difficult to pound, and much depends upon the degree of fineness of the powder, the residue, after one treatment with alcohol, is removed from the displacement apparatus, dried, and pounded again, mixed with hydrate of lime, and extracted again. It is now more readily pounded, because the coffee has lost its horny nature by the treatment with alcohol, and there is no difficulty in completely exhausting the coffee. The clear spirituous extracts obtained in this manner are submitted to distillation, the residue in the still rinsed out with warm water, and the supernatant oil separated. The liquid is then concentrated until it solidifies in the cold into a crystalline mass, which is brought upon a close strainer, and freed as much as possible by pressure from the liquid, which, on evaporation, furnishes some more caffeine. When the impure caffeine

has been freed as much as possible by pressure between blotting-paper from adherent oil, it is purified by dissolving it in water with the addition of a little animal charcoal and recrystallisation, and the preparation obtained in this manner in dazzling white crystals of a satiny lustre. The author obtained from 5 lbs. of coffee in general not more than 3 drms., from 10 lbs. 7 drms., and from 100 lbs. the largest amount, namely, 6 oz. and 4 scruples of caffeine. According to this, good Brazilian coffee contains 0·57 per cent. of caffeine. At the same time the author obtained on an average 10 per cent. of a green liquid oil, and 2 per cent. of a yellow solid fat.—*Archiv. der Pharm.*, lxviii. p. 148, and *Chemical Gazette*, February 16, 1852.

ON THE PRODUCTION OF CHLOROFORM FROM CHLORIDE OF LIME AND THE ESSENTIAL OIL OF TURPENTINE. BY J. CHAUTARD.

On mixing intimately in a retort 600 parts of water, 200 parts of chloride of lime and 25 of oil of turpentine, and submitting the mixture to distillation, a violent re-action occurs, and at the same time a very agreeable ætherial odour is manifested. A large quantity of carbonic acid gas is disengaged, which, as it causes the matter to froth, necessitates the employment of large vessels. On removing the retort from the fire as soon as the mixture begins to rise, the operation goes on well, and continues of itself to the end. The receiver contains three layers, frequently intermixed. The first consists of essential oil, which appears to have escaped the re-action; the lower one is an ætherial liquid, with the odour of chloroform; the intermediate layer consists of water, holding in solution a considerable amount of the preceding product. The latter is separated by means of a pipette, and rectified on the water-bath; two or three treatments of chloride of calcium, and a few fractional distillations, suffice to render it perfectly pure.

This product presented all the properties and the composition of the chloroform of the methylic series. It is a perfectly colourless, highly mobile liquid, with a very sweet taste, and a most agreeable odour, heavier than water, in which it dissolves perceptibly, communicating to it the two preceding properties; it boils at 145°·4 F. On analysis it furnished C 10·47, H 1·03, Cl 88·59; theory requires C 10·05, H 0·84, Cl 89·11.

The slight excess of carbon and hydrogen obtained must, I think, be attributed to a small quantity of carburet of hydrogen, which tenaciously accompanies the chloroform, and from which it might perhaps be freed by distillation over sulphuric acid. This would at the same time account for the few degrees of difference between the boiling-point of the substance under consideration and that admitted for chloroform.

I have no doubt that, by modifying the above process, we shall succeed in obtaining chloroform at far less expense than by the method of preparation generally in use.—*Comptes Rendus*, Dec. 15, 1851, and *Chemical Gazette*, Feb. 16, 1852.

ON THE USE OF KOUSSO. BY AUGUSTIN PRICHARD, ESQ.

Upon looking over some works on Ethiopia and Abyssinia, I find the following accounts of the kousso, and have extracted them, under the impression that they may be of interest to some of your readers.

The first is taken from "A New History of Ethiopia. By the learned Job Ludolphus, counseller to his Imperial Majesty of Saxony, &c." The date of this, the second edition of the English translation, is 1684.[1]

"There is another Tree which Godignus praises, most excellent against the Worms in the Belly: a Distemper frequent among the Abessines, by reason of their feeding upon Raw Flesh. For remedy whereof the Habbesines Purge

[1] This Ludolphus was the friend and pupil of the famous and learned Abyssinian monk, Abbas Gregorius, whose life is shortly narrated as a preface to the work itself.

themselves once a moneth with the Fruit of this Tree, which causes them to void all their worms."

In the appendix upon natural history, published in 1790, with the large edition of Bruce's travels, there is a minute account of the tree, which he calls *Cusso* or *Bankesia Abyssinica.*

"The Cusso is one of the most beautiful trees, as also one of the most useful. It is an inhabitant of the high country of Abyssinia, and indigenous there. I never saw it in the Kolla, nor in Arabia, nor in any other part of Asia or Africa. It is an instance of the wisdom of Providence, that this tree does not extend beyond the limits of the disease of which it was intended to be the medicine or cure."

"The Abyssinians of both sexes, and at all ages, are troubled with a terrible disease, which custom, however, has enabled them to bear with a kind of indifference. Every individual once a month evacuates a large quantity of worms; these are not the tape-worm, or those that trouble children, but they are the sort of worm called ascarides; and the method of promoting these evacuations is, by infusing a handful of dry Cusso flowers in about two English quarts of *bouza*, or the beer they make from *Teff;* after it has been steeped all night, the next morning it is fit for use. During the time the patient is taking the Cusso, he makes a point of being invisible to all his friends. * * * * The Cusso is planted always near churches among the cedars which surround them, for the use of the town or village * * * The whole cluster of flowers has very much the shape of a cluster of grapes, and the stalks upon which it is supported very much like the stalk of the grape. The flower itself is of a greenish colour, tinged with purple; when fully blown, it is altogether of a deep red or purple."

Bruce gives two plates of the tree, and thinks it probable that it may be found in 11° or 12° north latitude in the West Indies or America. He also says:—"It is alleged that the want of this drug is the reason why the Abyssinians do not travel; or if they do, most of them are short-lived."

The fact, that both these writers allude to the monthly discharge of worms, is very curious, and of course founded upon the truth, as they record it independently of each other, at an interval of more than a century, upon their own personal observation; and it is scarcely necessary to add, that if the plant was a *cure* for worms, there would be no occasion to take it so frequently; and, moreover, if the supply was as plentiful as described, the disease might have been destroyed, supposing it to have been *curable* by the kousso.

Recent hospital records, founded upon long experience in this country, have proved that it is a useful remedy, but not more to be relied on, as a means of radical cure, than many others we have nearer at hand.—*Provincial Medical and Surgical Journal*, 21st January 1851, p. 51.

POISONING BY CANNABIS INDICA. BY J. GARDNER, ESQ., M.R.C.S.

In the year 1848, while acting as surgeon to an East Indiaman in Calcutta river, I was hastily summoned one night to an adjoining ship, and from the imperfect answers of the men as to the nature of the case, supposed it cholera, as it was then raging rather freely among the shipping. However, on my arrival on board, the following scene presented itself:—The surgeon, second officer, and the Custom-house officer were in a state of narcotism from the effects of the extract of hemp, which the former had made, and persuaded the other two to take with him as an experiment, thinking to have the stimulating and exhilarating effect only of the drug; but the dose was too strong, and I learnt from the surgeon, who was the least affected of the three, that the dose to each had been about three grains of the extract, and it appeared to act according to the peculiar idiosyncrasy or constitution of each. They were each in a state of collapse. The doctor, with the aid of stimulants, soon recovered sufficiently to explain how matters stood; the second officer required external as well as internal stimulants, with cold affusions; and the poor Custom-house officer, being of a weaker con-

stitution, had nearly succumbed to the action of this powerful narcotic, and two hours had elapsed, with the aid of turpentine enema, cold affusions, ammonia, and constant moving about, before he was out of danger and re-action thoroughly established. They all suffered from headach and lassitude the next day, otherwise no ill effects followed. It was a lesson, however, to the surgeon to be more careful in future in experimentalising with such a powerful drug as the hemp.

Cases of poisoning with the hemp are rare, especially in this country, where the preparation is only used medicinally. The effects seem to be precisely analogous to those of opium. There was the contracted pupil, pale, clammy countenance, and the stupor, unless roused. In a medicinal point of view its action seems more violent and uncertain than that of opium, and the preparations are less to be depended upon, as sometimes I have seen it act with great violence, producing great excitement and even high delirium, and at another time the same dose would scarcely have any effect. I have given it in chronic bronchial affections and asthma with decided advantage, in doses of 10 or 15 min. of tinct. in elderly people, but do not consider it applicable where there is plethora, or in acute cases. I have likewise tried it among the natives in cholera, but, like most other remedies in that disease, with very little benefit. Great quantities are consumed by the natives under the name of gunjah and bang, which they smoke in the hubble-bubble, or, among the higher classes, in the hookah. It is then made into a soft mass, and mixed with other ingredients, and when smoked through rose-water the effect is exceedingly pleasant and soothing, and far preferable to tobacco, as you avoid the unpleasant odour.—*Medical Times and Gazette*, Feb. 7, 1852.

MAGNESIA AS AN ANTIDOTE TO SALTS OF COPPER. BY M. ROUCHA.

M. Roucha has published in the "Gazette Médicale de Strasbourg" some observations which tend to prove,—

1st, That calcined magnesia completely arrests the symptoms of poisoning by sulphate of copper, when it is administered sufficiently soon after the injection of the poison.

2d, That the dose of magnesia necessary to neutralise the effects of this salt of copper is at least eight parts of the antidote to one of the sulphate.

3d, That, as the magnesia behaves to other salts of copper as it does to the sulphate preceding the formation of a soluble copper compound in its presence, it is very probable that it will serve as an antidote to all the salts of copper.—*Journ. de Pharm. et de Chemie*, November 1851.

ON THE ELIMINATION OF CERTAIN POISONS. BY M. A. F. ORFILA.

When a poison has been absorbed, and carried into the different tissues of a living animal,—Does it remain there for an indefinite period, or is it expelled from them ?

On the latter supposition,—How long time does the economy require for getting rid of the poison ?

By what emunctories is the poison expelled ?

These three questions involve all the considerations which bear upon the elimination of poison. The experiments requisite for settling such a question are very tedious. In eighteen months the author has not been able to submit to proof more than four poisons,—viz., corrosive sublimate, sulphate of copper, acetate of lead, and nitrate of silver. The following is the general plan upon which his experiments were conducted.

He administered to dogs every day, along with their food, a dose of the poison, which was so regulated as not to occasion serious lesions, and so not to produce death. The administration of the poison was suspended when it was judged that a sufficient quantity was administered, and he killed the animals—five, eight, fifteen days, one month, two months, &c., after the last dose of the poisonous substance. The textures of the animals were then analysed for the poisons which they had swallowed, in order to determine if their elimination

had been effected in five, eight, fifteen days, one or two months, &c. He also tested the urine voided by the animals, both during and after the administration of the poisons. He also examined for mercury the urine and saliva of the patients in the Hôpital Lourcine, of Paris, several days after the suspension of the mercurial treatment to which they had been subjected.

The experiments have shown, that when animals are made to swallow for some days corrosive sublimate, acetate of lead, sulphate of copper, or nitrate of silver, the mercury in general disappears from their organs in eight or ten days (in one single instance he found it on the eighteenth day); that the lead and copper can be found in the liver and in the thigh-bone eight months after they have ceased to be introduced into the stomach; that the silver, the presence of which in the liver can be in some cases demonstrated at the end of six months, is not in other cases found six weeks after the cessation of the administration of the nitrate.

In the course of his experiments, he has found that the lead, copper, and mercury pass into the urine; but, whilst the lead and copper pass off by the renal secretion only during two days after the administration of their salts, the mercury continues to pass off by the kidneys for eight days. The silver can never be found in the urine of animals which take the nitrate.

The author conceives that some deductions of interest may be arrived at from these experiments, both in relation to physiology, pathology, and medical jurisprudence.

The *permanence* of poisons,—that is, their indefinite residence in the tissues of the body, is far from being demonstrated. He conceives that the actual state of science, as respects these questions, may be stated thus:—"Certain poisons are eliminated rapidly, others remain a long time in the economy, and appear to be tolerated by certain organs."

The author is struck by the coincidence, that lead and copper, which occur normally [?] in the bodies of animals, are exactly the metals which, after an accidental introduction, appear to remain longest in their tissues. And he states, that he always operated in such a way as to avoid error; the lead and copper which he found were never normal.

The author then offers some remarks on the importance of the urine as the emunctory by which poisons are in general eliminated; and, as a corollary from this, on the propriety of the use of diuretics in the treatment of cases of poisoning; and he concludes his memoir with some supposed cases, in which these results might have a medico-legal importance.—*Gazette des Hôpitaux*, 24th January 1852.

[M. F. Orfila's observation as to the greater tendency to remain in the organs of those metals (lead and copper) which occur normally in the body, is a hasty conclusion. It is to us not in the least degree apparent, that there is any relation between the duration of the metal's residence in the textures and its normal occurrence in the body. 1st, Because it is not in any way established that lead and copper do occur *normally*, or otherwise than merely accidentally, in the body; and, 2dly, That, in the case of one metal, and that one of those on which M. Orfila has experimented—silver—it is not pretended that it is a normal constituent of the body, and yet its permanence in the system is a fact which is established, though M. Orfila does not seem to think that this is the case with regard to any poison. He surely has forgot that persons treated for epilepsy by silver salts become permanently and indelibly stained by the silver remaining in their tissues.]

A CASE OF POISONING WITH OIL OF TANSY. BY JOHN C. DALTON, JUN., M.D.

E. S., a fine healthy looking girl, about twenty-one years of age, died at the house of Mr A. in Boston, on Wednesday, the 7th of May 1851. She had been employed in Mr A.'s family as a sempstress since some time in the previous winter, living in the house during the week, but going away on Saturdays to a cousin's in Pleasant Street, and returning to Mr A.'s on Monday morning. She

had been for some months receiving the attentions of a young man, who was reputed to be engaged to her. None of her friends, however, suspected anything to be wrong with her until Monday, May 5, when her cousin, with whom she had been spending Sunday as usual, perceived the odour of tansy in the room which she had occupied; whereupon it occurred to her that the girl might have become pregnant, and used the drug for the purpose of producing abortion.

On Tuesday she was engaged in her ordinary employment, and dined heartily a little after five o'clock in the afternoon. She went up stairs to her room about half-past nine o'clock. The cook, who occupied a room above, went up with her and stopped in her room, conversing for some fifteen minutes. The girl's manner was perfectly natural and cheerful, as it had been throughout the day. About a quarter before ten o'clock the cook left her preparing for bed, and went up to her own room.

Nothing more was heard from her till about eleven, when Mr and Mrs A., who were sitting in the basement-room, heard a scream, which they supposed to come from one of the children. Mrs A. went immediately up stairs, and on entering Miss S.'s room, found her on the floor, by the side of the bed, insensible and in violent convulsions. She had evidently fallen out of bed, as she was undressed, and the bed-clothes were disturbed, and had been partially dragged on to the floor with her. Dr Morrill was immediately sent for, and arrived in about ten minutes. He sent also for me, and I arrived at the house at half-past eleven.

The girl was then lying on her back by the side of the bed, and presented the following appearances:—Total unconsciousness; cheeks flushed, of a bright red colour; eyes open and very brilliant; pupils of equal size, widely dilated and immoveable; sclerotics injected; skin warm, not remarkable as to moisture; respiration hurried, laboured, stertorous, and obstructed by an abundance of frothy mucus, which filled the air-passages, and was blown from between the lips in expiration; the breath had a strong odour of tansy, as had been already observed by Dr Morrill; pulse quite full, forcible, 128; at intervals of five to ten minutes the body was convulsed by strong spasms, in which the head was thrown back, the respiration suspended, the arms raised and kept rigidly extended, and the fingers contracted. After this state of rigidity had continued for about half a minute, it was usually succeeded by a tremulous motion, often sufficient to shake the room, together with very faint and imperfect attempts at inspiration. The whole interval, from the commencement of the convulsion to the first full inspiration, varied from a minute to a minute and a half. Occasionally the tongue was wounded by the teeth, and the saliva slightly tinged with blood. Immediately after a convulsion the countenance was very pallid and livid, from the suspension of respiration, and the pulse exceedingly reduced in strength and frequency. The pulse and colour then gradually returned until the occurrence of the next spasm. It was very common, a few seconds after the termination of a convulsion, for the head to be drawn slowly backward, and the eyelids, at the same time, stretched wide open. In the intervals of the convulsions, the limbs were mostly relaxed, but the jaws remained clenched.

A vein was immediately opened in the right arm, and about Oij of blood taken away. After this, the pulse became much softer, and the face lost its bright colour. There was, however, no change in the condition of the pupils, nor return of consciousness, nor other improvement in the appearance of the patient. It being impossible to get anything down the throat, two injections of an ounce of wine of antimony, with about ʒss. of powdered ipecac., were thrown up the rectum at intervals of about half an hour, but produced no apparent effect.

On searching the room, a ℥ij. phial was found in the pocket of the girl's dress, wrapped in a piece of paper, labelled "Oil of Tansy," and marked with the name and address of an apothecary in Pleasant Street. The phial contained ʒv. of the oil of tansy of the ordinary purity. A mug was also found, from which she had apparently drunk the oil mixed with water, as it smelt very strongly of the drug, and still had a drop or two of it at the bottom.

The condition of the patient continued much the same for about an hour. The convulsions, however, gradually became less protracted, and the failure of the pulse after each attack more complete, at the same time that it recovered strength less perfectly in the intervals. The countenance also became somewhat sunken and the temperature of the skin reduced. About one o'clock, six leeches were applied to the forehead and temples, and sinapisms put on the calves of the legs. The leech-bites bled freely.

Towards two o'clock the alteration for the worse became quite rapid. Pulse 124 and feeble; respiration 36, and attended with less muscular effort than at first; the left cornea was glazed, but the right continued brilliant; a little inward strabismus of the right eye, and the mouth and nose drawn a little to the right side. Occasionally, a slow, lateral, rolling motion of the eye-balls. At five minutes past two she had the last convulsion, which was much less violent than the earlier ones, and lasted only half a minute. There was no recovery of the pulse after this attack, and she died at a quarter past two A.M.

Autopsy ten hours after death.

Countenance natural; cadaveric rigidity very strong; only slight purplish discoloration of dependent parts; no ecchymoses anywhere; no effect had been produced by the sinapisms on the legs.

Head.—Scalp not injected; distinct, but not excessive dryness of arachnoid over hemispheres of brain; no effusion, congestion, or other unnatural appearances anywhere about encephalon.

Chest.—Heart and pericardium natural; left ventricle firmly contracted; blood everywhere unusually fluid; interior of heart exhaled a distinct odour of tansy, as also cut surface of pectoral muscles.

No alteration of pleura; lungs rather shrunken, crepitated perfectly everywhere, and were not at all engorged; air passages not remarkable, except for a little redness of posterior surface of epiglottis.

Abdomen.—Strong odour of tansy in peritoneal cavity; a few drachms of thin fluid in pelvis; peritoneum natural in appearance.

Œsophagus natural internally, except that epithelium was somewhat deficient in its lower part.

The stomach contained about ℥xij. of a semi-fluid, yellowish-gray substance, consisting of partially digested food, potato, cranberries, onions, &c., mixed with an abundance of small, brownish-yellow, glistening oil globules, and exhaling an excessive odour of tansy; mucous membrane generally pale, not vascular in any part, but throughout nearly the whole of great pouch brownish and much thinned and softened, so that for a considerable space it was nearly or quite destroyed. There was an old, whitish, slightly puckered cicatrix of the mucous membrane on the posterior wall of stomach, near small curvature. No other morbid appearance.

The lacteals of the mesentery were very distinct, and distended with milky chyle.

Small intestines were natural internally throughout. They contained, at their upper part, pasty masses of dusty-coloured chyme, mixed with oil of tansy.

Below, the contents were less abundant, and were unmixed with oil.

Large intestine contained yellowish fæces, and small masses of a brownish powder, apparently ipecac. Mucous membrane natural.

Spleen rather shrunken, flabby, and deficient in blood. Other abdominal organs not remarkable except for slight paleness.

Urinary bladder contained ℥ij. to ℥iij. of urine.

The uterus was enlarged, so that its upper edge came two and three-quarter inches above the level of the symphysis pubis. It contained a well-formed female fœtus, about four months old.

There was not the least appearance anywhere of the fœtus or membranes having suffered any disturbance.

The left ovary, which hung down a little lower than the right, had near its external extremity a small conical prominence, where the fibrous coat was wanting,

and its place occupied by peritoneum alone. There was a very slight appearance here of a cicatrix, visible only on close inspection. There was no unusual vascularity here, or at any other part of the ovary. Beneath this prominence the corpus luteum could be felt through the ovarian tissue, tolerably firm and well defined, and having the form of a sphere, compressed laterally, much like that of the crystalline lens. On dividing the ovary longitudinally through the prominence, the corpus luteum was exposed. It presented a nearly circular section, measuring seventh-eighths of an inch in its long diameter, and three-fourths of an inch in its short. It consisted externally of a convoluted wall, of a dull-yellow colour, measuring at its deepest part a little over three-sixteenths of an inch in thickness. The space inclosed by the yellow wall was occupied by a colourless, reticulated, fibrinous coagulum, which possessed a few minute vessels. This central coagulum was much compressed laterally; so that, although it presented a cut surface of about half an inch in diameter, it had hardly more than one line in thickness. There was no cavity nor fluid anywhere.

Both ovaries were carefully divided in every direction, but only one other body was found having any resemblance to a corpus luteum, and that was so small and imperfect as to be hardly recognisable. There were many Graafian vesicles in the interior of each ovary, varying in diameter from three-sixteenths of an inch downward, but none at all prominent on the surface. Both ovaries were quite healthy.

It was subsequently ascertained that the oil of tansy was obtained, at the shop of the apothecary whose label it bore, on the evening of Friday or Saturday preceding the girl's death. The apothecary's clerk, who recognised the bottle, testified at the inquest that he put up in it ℥ij. of oil of tansy, and delivered it to a girl about fourteen years old, who stated that the family that sent for it wished to take it into the country. The patient, therefore, undoubtedly took ℥j. and ʒiij. of the drug. It seems probable that the violent action of the poison commenced at eleven o'clock, at the time the family heard the patient scream; and if we allow fifteen minutes for the absorption of the oil after it was swallowed, it would give three hours and a half from the time of taking the drug till the patient's death. Fifteen minutes may seem rather a long time for the operation of a volatile oil to be delayed, but it is probably no more than should be allowed. In a case which recently came under the notice of Dr Dalton, of Lowell, a girl took a quantity of oil of tansy just before dinner. She then went into the dining-room, sat some time at the table, ate with apparent relish, felt sick, left the table, went into the yard, vomited what she had eaten, and immediately fell down insensible and convulsed. She recovered, after remaining a long time unconscious. The only other recorded fatal case of poisoning with this oil that I am acquainted with also occurred in Boston, under the care of Dr C. T. Hildreth, and was published in the "American Journal of Medical Sciences" for May 1835. In that case, the woman took ℥ss. of the drug, and did not lose consciousness entirely till three-quarters of an hour afterwards, though she was convulsed at intervals before that time. After unconsciousness became complete, she did not again become sensible, and died rather less than two hours after taking the poison.

The present case is another instance of the extreme violence to which the system may be subjected even in the early months of pregnancy, without inducing abortion. Though all the muscles, both of the body and limbs, were for three hours and a quarter subjected to a succession of the most violent contractions, there was no sign of abortion, and after death the ovum was found in the uterus entirely undisturbed. In Dr Hildreth's case also, pregnancy existed but a few weeks advanced, and the drug was undoubtedly taken for the purpose of producing abortion, but nothing of the kind took place. The general symptoms in that case were similar to those described in the foregoing, the most remarkable difference being the more gradual loss of consciousness, and the more rapid death after a much smaller dose.—*American Journal of the Medical Sciences*, January 1852.

DISINFECTING PROPERTY OF CHLOROFORM.

Dr Auguna of Constantinople, in a Memoir (sopra una nuova proprietà del cloroformio), establishes the excellence of chloroform as a disinfecting agent, and shows, by reference to some highly interesting experiments, how this, its newly-discovered virtue, distinguishes chloroform from the older anæsthetic sulphuric ether. Taking three wide-mouthed and thoroughly clean bottles, Dr Auguna placed in one a small quantity of chloroform, and in another a small quantity of sulphuric ether; while into both he introduced a piece of the muscle of the ox. The muscle was placed in the third bottle, but no fluid was added; the three were then accurately closed. It was soon observed that the colour of the flesh in the bottle containing chloroform changed from a deep red, its original hue, to a vermilion shade, but that the muscle in the bottle containing ether remained unchanged. At the termination of a week, the effect was still more clearly displayed; while the flesh in the bottle of air remained unaltered, that in contact with the chloroform had assumed the appearance of cooked meat. Upon opening the bottles, the flesh in the ether, and that in the air, exhaled a most offensive odour, and was itself far advanced in putrefaction. Not so that preserved in chloroform; it remained still undecayed, and possessed no smell, save that peculiar to this fluid. It is not only over flesh, but over fruits and seeds, that Dr Auguna has found chloroform to possess an antiseptic property. Dr Auguna estimates that $\frac{1}{200}$ of chloroform is sufficient to oppose the putrefaction of a piece of fresh muscular fibre.—*Gazzetta Medica Italiana.*

ON THE EMPLOYMENT OF BELLADONNA IN THE TREATMENT OF FISSURES OF THE ANUS. BY DR G. PEIRANO.

The author had first recourse to this method of treatment in a case in which all other means of relief had failed. Believing that the great obstacle to the cure lay in the spasmodic contractions of the sphincter, he was led to apply to the circumference of the anus, several times daily, a small quantity of an ointment prepared by mixing one and a half drachms of the extract of belladonna, with an ounce of axunge. In seventeen days the cure was complete. Several other cases had occurred, and confirmed his confidence in the remedy.—*Gazzetta Medica Italiana.*

Part Fifth.

MEDICAL NEWS.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

MEETING II.—*Wednesday, January 7th,* 1852.—Dr BEGBIE, President, in the Chair.

REGISTRATION OF CAUSES OF DEATH.

Dr W. T. Gairdner read a paper "On the Registration of Causes of Death, in Public Institutions and in Private Practice." The object of the paper was to explain the principles followed by the author in the registration of deaths in connection with the pathological department of the Royal Infirmary, and to endeavour to obtain the co-operation of the Society towards carrying out a more extended system of registration of deaths, on similar principles, founded on data contributed voluntarily by the medical profession in Edinburgh and

Leith, and especially by the members of the Society. The author maintained, that many of the fallacies and imperfections of former systems of registration arose from the arbitrary limitations imposed upon practitioners in their statements of the cause of death, which was often much too complex to be with propriety registered under one, or even under two or three headings. The object of registration should be the concise statement of all the phenomena tending to produce the fatal event, in so far as they can be clearly ascertained, and subordinate phenomena, instead of being excluded from the register, or confounded with what might be regarded as the main disease, ought to be in all cases separately stated, with the view of securing correctness and uniformity, and of furnishing data for the investigation of the laws and combinations of disease. The nosological formulæ employed ought to be so contrived as to adapt themselves to every variety of information, the most general as well as the most detailed; and the registration of the same case under a variety of headings, instead of being regarded as an evil, should in reality have the effect of a check upon erroneous inferences. Many illustrations were given from the results of the Registrar-General's tables; and the author concluded by placing in the hands of the members copies of a draft of a nosological table, which he had drawn up for his own use in the Royal Infirmary.

Dr Alison, *Dr Christison*, and *Dr Andrew*, agreed generally with the author of the paper in the principles he had maintained with respect to registration of deaths, and considered that the adoption of them would be an improvement on the methods of registration at present in use.

Dr Christison remarked, that it was only due to the managers of the Royal Infirmary to state, that proposals regarding a correct system of registering the causes of death occurring in that institution had been frequently under the consideration of the board, and that they had even authorised a considerable expenditure of funds in endeavouring to establish improvements based on these proposals.

He moved, that it be remitted to the council to appoint a committee on this subject to take into consideration the scheme of Dr W. T. Gairdner, and to report to the Society at a future meeting. Seconded by Dr Taylor, and carried unanimously.

CASE OF AXILLARY ANEURISM.

Dr R. Mackenzie read the case of axillary aneurism which appeared in our February Number, p. 110.

Professor Miller remarked, that having heard the particulars of this case for the first time, he did not feel warranted in giving any definite opinion as to the nature of the tumour. Yet it seemed very plain that it could be but one of two things,—either a false aneurism by abscess, as in the case of Mr Liston; or an ordinary spontaneous aneurism, whose sac had suppurated after deligation of the artery, and after some progress had been made towards cure of the aneurism; and he inclined to adopt the latter alternative, in consequence of pus having been found in the sac after death. He considered that an important point of pathology was connected with this question,—namely, whether an unopened abscess has, or has not, the power of eroding a contiguous artery by ulceration. He had always maintained the affirmative, and very much on the following grounds:—1. *Open* abscesses, ulcerating in their walls, frequently erode *both arteries and veins*, causing formidable hemorrhage, often fatal. 2. *Unopened* abscess has the power of eroding contiguous *vein*, as facts prove. Whence we might infer this—3. Unopened abscess perforates vein, but arterial tissue is more prone to ulceration than venous; therefore unopened abscess (*à fortiori*) may perforate a contiguous artery. 4. The evidence of facts,—some of them *prove* (1) that in the case of open abscess, with bleeding from a perforated artery, the erosion must have taken place *very soon* before the open state of the abscess was established; (2) while others equally *prove* that the perforation *had* occurred *during the occult condition* of

the abscess, so constituting the Listonian form of false aneurism. These cases of the latter class he considered somewhat in detail; and among them one which had occurred in his own practice, in which false aneurism had followed perforation of the ulnar artery by abscess, and which case he had published in his "Principles of Surgery." But of the series, perhaps the most conclusive were those related by Liston, Breschet, and Quain. He believed that it was thus demonstrable that the lesion in question does occur; the kind of abscess most likely to cause it being an acute abscess in the near vicinity of an artery, more especially when that vessel lies over the abscess, between it and the surface; or still more likely a chronic abscess so situated, which in its growth has become acute—probably in a patient of debilitated frame. From this important fact in pathology, there emerged a still more important rule in practice,—namely, the propriety of opening such an abscess *as soon as possible,* though yet deep and small, so that all chance of aneurismal erosion may be prevented, whilst at the same time the artery and wall of the abscess being not yet contiguous, there may be no risk of erosion and bleeding, in consequence of that ulceration of the abscess's wall, which so generally follows establishment of the open condition. As to the point of practice in the supposed case—of a Listonian false aneurism having been diagnosed during life,—he differed from Dr Mackenzie. He preferred the Hunterian operation to the direct. In ordinary traumatic false aneurism—as at the bend of the arm—the direct operation was usually preferable; but then the artery was expected to be in all respects sound at the deligated parts, immediately above and below the aperture of communication with the sac. Here it is otherwise. From the nature of the case, it is to be expected that the patient, alarmed by new sensations and symptoms in the part, will anxiously seek the surgeon's aid very soon after perforation has occurred. The vessel at the eroded parts necessarily must be *inflamed* and *ulcerating*, and therefore in a most unsuitable frame for sustaining the ligature. This would come away prematurely, and secondary hemorrhage would follow. Whereas by tying the vessel on the cardiac side, at a point sufficiently distant to avoid the inflamed disc, a vessel in all respects suited for deligation would be found, degenerated neither by chronic steatomatous change nor by acute inflammation. And while reasoning thus showed that such an operation might be *safer* than the direct, experience *proved* that this safer operation was quite *effectual* for the cure of ordinary false aneurism—and why not of this? The experience of the late Mr Liston spoke plainly on this point.

Mr Spence stated, that he felt no doubt as to the possibility of an artery communicating with the cavity of an abscess, in consequence of the ulceration of the vessel, and that he had always pointed out that in his surgical lectures as one of the dangers of neglected abscess in the neighbourhood of large vessels. There was one point which he thought had not been enough attended to by those who denied the likelihood of such an occurrence. They usually pointed to the fact of large arteries, exposed in sloughing ulcers, resisting the destructive action longer than any other texture, as an evidence of the arterial tissue being possessed of a peculiar organisation and vitality. Mr S., on the other hand, held that vitality of the artery in such cases depended on the integrity of its peculiar vascular supply. When an artery is exposed in ulcer, the vessel and its sheath are still attached to, and receive nutrition from, the deep-seated parts. But the artery is in a very different position, when a portion of it is fairly insulated by purulent matter, as in the cavity of an abscess; for then the part of the arterial tissue so deprived of its vascular supply, will undergo the process of ulceration or slough as readily as other textures. In support of this opinion, Mr S. showed a preparation from the University Museum (Catalogue p. 77). The preparation showed the tonsil destroyed by an abscess, and external and inferior to it a large collection of pus, which had laid bare the great vessels and nerves below the angle of the jaw. The common carotid artery presented an ulcerated opening, near its termination; and there was another ulceration in the internal carotid, near its origin. The internal jugular

vein was obliterated near the division of the common carotid. The patient, a female, had suffered from swelling and pain at angle of jaw, and difficult deglutition, for some time. Two days before death she ejected some pus and blood from the mouth. Next day, the large abscess below the jaw was punctured with a lancet, when fœtid pus and sloughs were discharged; two hours afterwards arterial hemorrhage occurred from the puncture, and recurred repeatedly during the day until evening, when the patient died. The abscess which had denuded the vessels having, in this case, been opened only two hours before the arterial hemorrhage commenced, Mr Spence thought there could be no reasonable doubt that the arterial tissue had been destroyed by the diseased action prior to the puncture of the abscess, though the slough had not then separated. No one could suppose that ulceration of the coats of the vessel had taken place in the short space of time between the opening of the abscess and the commencement of the bleeding.

Dr Mackenzie said, that having noticed in the first part of his paper the repeated instances which were recorded of arteries having given way, by ulceration, into the cavities of abscesses which had been already opened, he had excluded all such cases, as not bearing directly on the point in question—viz., the formation of false aneurism by ulceration of the coats of an artery within the cavity of an unopened abscess. He was conversant with all the cases mentioned by Mr Miller, but had avoided detaining the Society with an account of them, as he did not consider them analogous to his own case. On this account, too, he had only alluded very briefly to a similar lesion of the venous coats. Dr M. had hoped his paper might have elicited further information on the subject from members of the Society, but it appeared, as far as he could find, that the three cases he had quoted from M. Robert (of Paris), Mr Liston, and Mr Quain (to which Mr Dewes' case might probably be added), were the only cases in which this form of aneurism had been distinctly proved. Dr M. was at a loss to understand how Mr Miller could attribute the origin of the traumatic aneurism of the ulnar artery, to which he had alluded, to the previous formation of abscess. The woman had been stabbed a little below the bend of the arm, and an unsuccessful attempt had been made to secure the artery, which was wounded at a point extremely difficult of access. The hemorrhage had recurred, and was arrested by compression. The wound healed, and the patient left the hospital, but returned in a short time with an aneurism at the seat of injury, on which Mr Miller performed the usual operation for traumatic aneurism with success. Dr M. could see nothing in this case to support the view Mr Miller had taken of it. On the contrary, he considered the history of the case in every way to correspond with that of the usual formation of traumatic aneurism. As to the treatment of the form of aneurism produced by the communication of an artery with the cyst of an abscess, Dr M. had only to repeat what he had already stated in the paper: he believed that were the character of such an aneurism recognised during life, the old operation would be more likely to be followed by a favourable result than the Hunterian operation. The prognosis was unfavourable under any circumstances; but he thought that the application of ligatures, a short way above and below the ulcerated opening in the artery, would probably be attended by less risk than the application of a single ligature on the cardiac side of the aneurism. The single ligature would not entirely arrest the flow into the aneurismal sac, and solidification of the tumour could not take place as in ordinary aneurism. Unless, then, the artery were obliterated in the neighbourhood of the ulcerated opening (an event which could not, in such a case, be looked for with any degree of certainty), hemorrhage must inevitably ensue on the escape of the purulent contents of the cyst by a spontaneous or artificial opening on its surface.

Profeseor Miller said, Dr Mackenzie had objected to his (Mr M.'s) explanation of the aneurism at the bend of the arm, in the example to which he had referred; and had mentioned that in that case bleeding had occurred some

days after the application of the first ligatures by Mr M. This bleeding, supposing it to have occurred, made no difference as to the theory of abscess causing aneurism. Dr Mackenzie supposed that Prof. M. had omitted to tie the principal vessel, and that from it the bleeding in question took place. This supposition was both unlikely and unnecessary ; unlikely, because the principal bleeding point was not likely to be overlooked in the free and thorough examination of the wound which was then made ; unnecessary, because it was more probable that the bleeding took place from one or other of the vessels tied,—these, inflamed and ulcerating, being obviously unsuitable for the plastic results after ligature. And this it was, doubtless, which had led Prof. M., as reported, to say, that thus it might be seen how Mr Guthrie's practice was not always expedient—viz., that when the bleeding point was inflamed and ulcerating, it was better either to trust to graduated pressure on the part, or to tie the vessel at a Hunterian point. In the case in question, the features which favoured Mr M.'s explanation were, the patient being discharged with a firm *depressed* cicatrix, signs of ordinary suppuration being reported in the narrative after dismissal, and in performing the ultimate operation the bleeding orifices being found lower than the part formerly tied. Those features had been untouched by the remarks of Dr Mackenzie, and were strikingly corroborated by the analogous case in the "Lancet," No. 1377, p. 92. In Dr Mackenzie's own case, it would not do to account for pus in the cyst after death, by supposing that the ligature of the subclavian had dried up the supply of blood, and that then the cyst had gone on secreting purulent matter uninterruptedly. For experiments on animals had demonstrated, that when even the largest vessels (in a state of health) were tied, free circulation was immediately restored on their distal aspect. And it was well known that, after the Hunterian cure of aneurism by ligature, the sac continued for some time to be fully supplied with blood. Prof. M. still adhered to his opinion as to the treatment of a Listonian false aneurism if diagnosed during life,—namely, ligature on the cardiac side. It was not inevitable that the sac should open. When the arterial perforation occurred, the case was thereby transferred from the category of abscess into that of aneurism, and was to be regarded and treated accordingly.

Dr W. T. Gairdner said, that while he agreed with the other speakers in admitting the possible perforation of an unopened abscess into the canal of an artery, he thought that, in Mr Liston's case, and perhaps in some of the others, the disappearance of the pus, and the absence of the local phenomena of its admixture with blood, were very inexplicable. Dr Henry Lee, of London, had lately pointed out, that whenever pus and blood came in contact, rapid coagulation of the latter was the result ; this was invariable when the mixture was made out of the body, and yet there was no evidence of such coagulation having taken place in Mr Liston's case, in which the pus, if ever present, must have been very thoroughly mixed up with the blood of the artery, and might have been expected to produce coagulation either in the sac, or in the course of the circulation.

Professor Miller said, the only explanatory circumstances he could state were the following :—The abscesses in question had been chronic, becoming secondarily acute, in patients of weak frame, consequently pus corpuscles would be few, and the contents would be mainly serum, and the gradual commixture of this fluid with living blood might be less formidable than the mingling of ordinary pus. In ordinary cases of pus-mingling, it was with the venous circulation ; the pus, consequently, getting immediate and direct access to the heart and lungs ;—whereas in these cases commixture was with arterial blood, and the pus could not reach these important parts without having previously passed through the systemic circulation, and become modified in character thereby.

PHYSIOLOGICAL SOCIETY OF EDINBURGH.

MEETING III.—*December* 20, 1851.—Dr BENNETT, President, in the chair.

VISCERA OF THE SHARK.

1. *Dr Cobbold* laid before the Society numerous dissections and drawings, recently made by him, of the viscera of a male porbeagle shark (*Squalus Cornubicus*), and entered at some length into the consideration of those organs, the development of which was especially interesting in a teleological point of view. There were several modifications of structure in certain of the viscera, the importance of which had not been, he believed, thoroughly made out; the numerous and curious arrangement of the lobes of the spleen; the anastomosis between the hepatic veins and the twigs of the cœliac arteries, constituting the "plexus mirabilis" of Müller; the supplementary testis, situated immediately behind the seminal reservoirs; and lastly, the question as to the probability of a function analogous to rumination in this and certain other fishes, as suggested by Professor Owen, were pointed out as subjects meriting further investigation. In relation to this last subject, Dr Cobbold observed, that the muscular tissue of the walls of the stomach partook of the microscopic characters of voluntary muscle, and this circumstance was in keeping with the well known fact, that a large proportion of fishes possessed the power of ejecting the contents of the stomach.

Mr Drummond stated that he had analysed the muscular flesh of the *Squalus Cornubicus*, in the specimen dissected by Dr Cobbold, and had found it to contain a larger amount than usual of creatine, amounting to 2·03 in the thousand parts of flesh; and also more fatty matter than occurs in muscle generally.

2. *Dr W. M. Dobie* exhibited a very successful preparation of the ganglionic corpuscles in the nerves of the skate. The preparation showed in a very clear and distinct manner the passage of the nerve tubes into the corpuscles. The granular matter contained in the tubes appeared to be continuous with that in the centre of the ganglionic corpuscles, but the relations of the wall of the nerve-tube to that of the corpuscle could not be satisfactorily made out. Dr Dobie stated that he had employed chromic acid as a re-agent, with the view of discovering in the fresh specimen whether the white substance of Schwann was continued from the nerve-tube to the wall of the corpuscle; but could not speak decidedly as to whether this were the case.

3. *Dr Dobie* likewise exhibited a section of the cartilage of the skate, showing a beautiful longitudinal arrangement of the cartilage-corpuscles around the vessels passing through the cartilage.

DIABETES.

4. *Mr Drummond* read the following paper:—

I beg to communicate to the Society the following particulars regarding the urine and blood, and the amount of sugar contained in the brain and liver, &c., of a man who died of diabetes mellitus. He was about 20 years of age, and was under the care of Dr Andrew in the Royal Infirmary.

The urine presented a pale straw colour, was clear and transparent, its average density was 1035. The usual tests indicated the presence of sugar in large quan-

tity. With respect to the relative proportion of the different constituents, the following is the mean of the analyses which were made weekly:—

Water,	921·92
Solids,	78·08
Sugar,	59·86
Urea,	2·4
Uric acid,	0·006
Extractives,	11·184
Ash,	4·63

The average amount of these different constituents eliminated in the course of twenty-four hours was as follows:—

Urine,	235·8	ounces.
Sugar,	14·1	—
Extractives,	2·6	—
Urea,	271·6	grains.
Uric acid,	6·7	—
Ash,	524·0	—

Blood.—The blood separated, shortly after being drawn, into a pretty firm clot and milky turbid serum. A portion of the serum was evaporated to dryness, and the residue exhausted with alcohol. The alcoholic solution was then evaporated, and the dry residue dissolved in water. A little acetic acid was then added, which caused considerable turbidity. The fluid was filtered, and then tested for sugar. Trommer's test, as well as the fermentation test, indicated distinctly the presence of sugar. On analysis, the blood yielded—

Water,	760·32
Blood corpuscles,	139·15
Fibrine,	1·7
Fatty matters,	1·8
Sugar,	2·0
Albumen,	84·0
Extractives,	3·0
Ash,	8·03

After death a portion of the liver and brain, as well as the contents of the stomach, duodenum, and small intestine, were obtained, with a view to ascertain whether there was any sugar present in these, and to what amount it existed.

The contents of the stomach were very acid, those of the duodenum were also acid, and those of the small intestine slightly so.

A portion of each was treated in the same way as the serum of the blood, and then tested. In all of them sugar was found to be present. In the stomach it was found, by fermenting the aqueous extract prepared as above, to amount to 25 parts in the 1000; in the duodenum, to 19·96; and in the small intestine, to 11·31 per 1000.

A portion of the brain was next examined in the same way. In it the sugar was found to amount to 14·2 in the 1000.

In the liver it amounted to 15·3 per 1000.

The amount of sugar was determined by fermenting the aqueous extract prepared in the way already mentioned from a weighed quantity of the substance. The aqueous extract of the liver and brain, after fermentation, presented a strong vinous odour.

It may not be out of place to mention here one or two conclusions which Dr Traube, a German observer, has come to in regard to the secretion of sugar in diabetes mellitus. From a very careful and elaborate series of observations on the urine of a diabetic patient, who was under his charge at two different periods, and which are reported in Virchow and Reinhardt's Archiv. for 1851, he observes,—

1st. That the intensity of the sécretion of sugar differs very much at different times of the day, and under different circumstances. Thus, while the patient was first under his charge, the amount secreted during the night (from ten and a half in the evening to five and a half next morning) was very small, being from 0·17 grammes to 1·4 grammes per hour. Between six and ten in the morning it was much more abundant, its maximum 4·4 to 2·8 grammes per hour. From eleven and a half to one and a half in the forenoon, it was 1·88 grammes maximum; minimum, 0·88 grammes. After mid-day the medium excreted per hour was 4·2 grammes; evening, 3·3 grammes. While the patient was under his charge the second time, the smallest quantity of sugar secreted was in the morning from four to eight and a half, its medium being 2·9 per hour. Between ten and eleven and a half, 7·7 to 10·7 grammes were excreted hourly. During the night (the time when least sugar was secreted, while the patient was first under his charge), it was now, half a year afterwards, 6·3 grammes maximum, 3·5 grammes minimum per hour.

2d. That there are two stages in diabetes mellitus. In the first stage, all the sugar excreted is derived immediately from the food; in the second stage, the sugar is not only formed from the food, but also from the constituents of the organism. This he thinks, because, during the first period of the illness of his patient, the sugar was always greatest immediately after food, and as soon as the process of digestion of a meal was finished, the excretion of the sugar ceased also. During the second period, however, the sugar seemed to be formed partly from the food and partly from the constituents of the body; for now, although the patient abstained from food for fourteen hours, considerable quantities of sugar were still excreted; whereas, formerly, it entirely disappeared from the urine in the course of six to seven hours after a meal. Dr Traube believes that the sugar so produced from the tissues of the body is formed in the liver; and he calculates that the quantity of sugar so produced is at the least 2·9 grammes per hour. From four and a half till eight and a half in the morning, during which time all the sugar passed off by the urine proceeded from the liver, he calculated that the quantity formed per hour was from $4\frac{1}{2}$ to $8\frac{1}{2}$ grammes.

3d. The secretion of sugar is greatest shortly after meals. The influence of the food, however, does not continue long. The sugar from the food disappears in great part after four hours, and after eight hours it has entirely passed off. After eight hours, the sugar ceases to be secreted during the first period of the disease; but in the second stage, the sugar never ceases to be formed. What is excreted eight hours after taking food, in this stage is wholly formed in the liver from the constituents of the organism.

With respect to the digestion of fat by diabetic patients, he believes that the greater portion of the fatty substances taken into the body is digested. Thus he found that a patient who took daily about three-quarters of a pound of fatty matters, passed in the fæces scarcely half an ounce.

MEETING IV.—*January* 3, 1852.—Dr BENNETT, President, in the Chair.

APPEARANCE OF INTESTINAL VILLI DURING DIGESTION.

Dr Bennett stated that he had lately examined with great care the intestinal villi of rabbits, cats, and dogs, during the progress of digestion, and had found that, so far from the villi being naked under these circumstances, they were almost always covered with epithelium. In dogs, it is true, the epithelium was easily separated by squeezing between glasses and by washing with water, but in cats they were by no means easily separated. He had observed that the villi themselves were filled frequently with fatty molecules, which often communicated to the cat's villi an opaque appearance. In dogs he had seen within them a few large oil drops, but in no case were they so numerous as had been lately described by Kölliker. So far from the epithelial cells being thrown off during chylifica-

tion, he was inclined, with the physiologist just named, to consider them as active during that process.

Dr W. T. Gairdner remarked that, at the time of the first epidemic of cholera, an opinion was extensively prevalent, that the intestinal canal was denuded of its epithelium in that disease. This opinion was founded upon observations of the large quantity of loose epithelium found in the intestinal canal after death, and on the absence of it, on the other hand, on the surface of most of the villi. During the last epidemic, however, Dr Gairdner had satisfied himself that the apparent desquamation of epithelium was in great part a post-mortem phenomenon; the epithelium separating with extreme ease from the dead membrane, although, as a general rule, it was not detached during life in any considerable quantity. Since making this observation, Dr Gairdner had been inclined to view with some distrust the idea of desquamation during digestion; but he had not made any special observations on the subject. In all diseases, it was, however, common, after death, to observe the villi denuded; and so readily did the epithelial covering yield to the simplest processes of maceration, that it was not at all easy to obtain, after death, a specimen of intestine in the normal condition.

Mr Barlow said he had paid some attention to the structure of intestinal villi, having often examined them in very young lambs and calves, during the time these animals were living entirely on milk. Digestion in these creatures may be said to be a continuous process, because they are constantly sucking, and the fourth or true digestive stomach is seldom empty. There is thus a continued passage of chyle along the intestines, and yet he had not succeeded in finding the villi naked. Young puppies and kittens are also favourable subjects for investigation; and after examining them at intervals, extending from five minutes to upwards of an hour after being suckled by the parent, he had always observed the villi invested by their epithelial covering, unless rendered naked by the mechanical manipulation necessary to bring them under observation.

ON THE STRUCTURE AND FUNCTION OF THE LYMPHATIC GLANDULAR SYSTEM. BY DR BENNETT.

Most of the facts and conclusions communicated to the Society on this occasion are embodied in the paper, published by the author in the present Number of this Journal. He, however, dwelt upon the facts arrived at by long continued investigation into the ultimate structure of the various glands. So far as he could determine, the structures of the thyroid body, spleen, and supra-renal capsules, served to secrete an organic fluid or blastema, in which molecules, nuclei, and cells were formed in all stages of their development. He had never been able to satisfy himself that the latter bodies were given off by a membrane in the form of an epithelium. In this thymus there were no shut sacs, but rather a series of follicular enlargements, communicating with one another at their basis. Here also it appeared to him that the enclosed nuclei and cells were formed throughout a fluid, and not in the internal surface of a membrane. The lymphatic glands closely resembled the thymus in structure, only there existed a communication between the follicular enlargements. It had been maintained that the nuclei and cells were given off from a basement membrane in these glands, but notwithstanding numerous sections with Valentin's knife, many attempts to see this by careful separation of the fibrous stroma with needles, as well as by means of maceration, the author had failed to discover any fact confirmatory of this view. He was, therefore, of opinion, that in these, as in the other bland glands, nuclei and cells were formed in an organic fluid, and not in a basement membrane. The pituitary body was like the thymus in structure, and the pineal gland resembled the thyroid body. In the young animal it contained shut sacs filled with molecules, nuclei, and cells; but in the adult these were filled with calcareous concretions of a botryoidal form externally, and presenting a concentric lamellar arrangement when fractured. They evidently formed a mould of the size and form of the shut sacs in which they were deposited. These concretions had been described and figured by Hassall.

The function of all these glands, Dr Bennett believed, was to form a multitude of nuclei and cells, which were ultimately converted into blood-corpuscles, as described by him in another place. (See paper amongst the original articles of this month's Number.)

MEETING V.—*January* 17, 1852.—Dr BENNETT, President, in the Chair.

CILIA IN THE PORIFERA.

1. *Dr W. M. Dobie* read a communication on the cilia and currents of the Porifera. He stated that he discovered the cilia of *Grantia compressa* in February 1850; that Mr J. S. Bowerbank being informed by Dr Johnston concerning the discovery, Mr Bowerbank proceeded to Tenby, in South Wales, in the summer of the same year, and succeeded perfectly in seeing the cilia in the particular sponge in which Dr Dobie had discovered them. Dr Dobie gave a full account of the results of his observations on *Grantia compressa* and *Grantia botryoides* during the years 1850 and 1851, and illustrated his communication by a drawing of the ciliated particles of *Grantia compressa*.

ON THE LACUNÆ OF BONE. BY MR DRUMMOND.

2. *Mr Drummond* read the following communication, which was illustrated by preparations.

By the older observers, the lacunæ of bone were regarded as small concretions of earthy matter, and were hence termed calcigerous cells. By Henle and others, they have been regarded as mere hollows in the osseous texture.

Mr Tomes speaks of them as small cells existing in the substance of the osseous texture, and calls them, accordingly, bone cells. He does not, however, state distinctly whether he believes that they contain any other structure. His observations, indeed, lead us to believe that he regards them as empty spaces, as, in short, mere dilatations of the canaliculi.

Todd and Bowman also regard them as mere excavations in the osseous texture, and believe that this view is confirmed by the fact of their being able to fill them with fluids, such as turpentine. Sharpey speaks of them as minute recesses in the bone. Mr Goodsir was the first who pointed out the real nature of the lacunæ. In his paper on bone he speaks of a hard and a soft portion. The hard consists of calcareous matters, deposited in a cartilaginous nucleus; the soft part is concealed in the cavities of the osseous corpuscles or lacunæ. The osseous corpuscles, or lacunæ, are thus, according to Mr Goodsir's views, not empty spaces, but contain unossified corpuscles, which he regards as the germinal centres, or centres of nutrition of the bone.

That the view taken by Mr Goodsir regarding the nature of the lacunæ of bone is correct, I think there can be no doubt. I find that, if I decalcify a piece of bone in a very dilute solution of hydrochloric acid, and then examine a thin section, that it presents the following appearances:—1st. The openings of the Haversian canals, surrounded by a series of concentric rings, corresponding to the lamellæ of the undecalcified bone. 2d. Arranged at pretty equal distances from each other in each lamella, or in the interval between the cartilaginous lamellæ, are seen a number of bodies presenting the following characters:—They are generally of an oval shape, measure about $\frac{1}{2500}$th of an inch in their long diameter, and somewhat less in breadth. They are solid, and present a granular surface, resist acetic as well as dilute hydrochloric acid, and present all the characters of the bodies to which the name nucleus is commonly applied. Altogether they resemble very much the nuclei which are brought into view on treating white fibrous tissue with acetic acid. These bodies correspond in their situation to the lacunæ of the unaltered bone, each corpuscle representing a lacuna.

That the bodies above described are really contained in the lacunæ, I have

satisfied myself by taking a portion of their bone,—such as the processes which are seen projecting into the medullary cavity of the long bones, or by making a thin section of a fresh bone with a knife without any grinding. On submitting such a portion of bone to examination with a power of 250 diameters, and adding a little dilute hydrochloric acid to it, we see that, as the earthy matter surrounding the lacunæ is dissolved, they gradually disappear, while in each a body, presenting the characters of the nuclei described, is distinctly seen. Each lacuna contains one of these bodies.

From observations which I have made on the development of cartilage and bone in the mammalian fœtus, I have satisfied myself that the bodies contained in the lacunæ are the nuclei of the original cartilage cells or their progeny.

In regard to the function of these bodies, I believe with Mr Goodsir that, as they are the active agents in the development of bone, so they are the active agents in its nutrition, or continued development.

3. *Dr W. M. Dobie* exhibited a thin flat spiculum, selected from the medullary canal in the femur of an ox killed a few hours before. The specimen exhibited numerous lacunæ or corpuscles when examined by the microscope, but was penetrated by no Haversian canal. The cavity of each of the corpuscles was seen to be entirely filled with a nuclear body, which nucleus, under the action of nitric and acetic acids, became spherical and surrounded with three or more granules. The demonstration was shown by way of confirmation of Professor Goodsir's observations, and served to illustrate Mr Drummond's communication.

MEETING VI.—*January* 31, 1851.—DR BENNETT, President, in the Chair.

ARTERIES OF THE SPLEEN.

1. *Dr Sanders* read a paper "On the Connection of the Minute Arterial Twigs with the Malpighian Sacculi in the Spleen." The author's observations had been made on the pig's spleen, boiled in acidulated water, and dried; of which five sections were then made, after moistening with water the surface to be cut. These sections are very clear and translucent; and although the corpuscular elements are blended together, the arteries, trabecula and malpighian sacculi, preserve their outline and distinctive appearance in great perfection. The sacculi are oval or circular in outline; the area clear, white, or gray; generally dark towards the centre by transmitted light, from the greater accumulation of the contents there; their diameter, twenty-five to thirty centimillimetres. The arterial twigs are recognised by the structure of their coats; and are frequently very conspicuous from containing blood. In certain sections, arterial twigs of three to six centimillimetres diameter are seen passing diametrically across the area of the sacculus; in other sections, the arterial twig is observed cut across in the centre of the area of the sacculus; and in series of sections of the same sacculus, while no vessels are seen in the first and last sections, the intermediate ones, from the central part of the sacculus, show the arterial twig or twigs passing through its interior. These specimens, which were exhibited to the Society, prove that the arterial twigs, in some cases at least, traverse the interior of the sacculi,—a more intimate relation to them than is generally believed or described.

This relation of the arterial twigs was seen frequently; and the sacculi had a pedicle consisting of the arteriole and its sheath. In other cases, the sacculus was placed sessile on a larger arteriole of ten centimillimetres diameter, without any arterial twig passing through its interior; and in other instances, the arteriole passed only obliquely through the interior of the sacculus, not traversing its centre. Stains of blood also often in linear arrangement, indicating capillaries, were seen in the interior of the sacculi.

The author concluded by directing attention to the following points:—

1st. The anatomical fact of the presence of arterial twigs of three to four centi-

millimetres diameter passing through the interior of the malpighian sacculi of the pig's spleen.

2d. The relation of this fact, together with the recent discoveries of a network of capillaries inside the closed follicles of the Peyers glands (Frey) of the lymphatic glands, thymus spleen, &c. (Kölliker Micr. Anat.), to the physiological import of "closed vesicle or sacculi."

3d. The author recommended the method of preparation by boiling and drying, as proposed by Professor Henle in Canstatt's Jahresbericht, part "Biologie," for 1851. In judicious limits, and as assisting other methods of inquiry, it is of great service in Histology.

2. *Dr Bennett* made a lengthy communication on the molecular basis of the tissues, an abstract of which will be given in the next month's Journal.

3. *Mr Drummond* exhibited to the Society a portion of the umbilical artery of a calf, for the purpose of showing that the entire fibres composing the coats of the vessel could be uncoiled, indicating that they were not arranged in circular bands, but probably in a spiral manner. He also stated that no distinction existed in the artery of the fœtus between the so-called transverse and longitudinal coats, the fibres of both being intermingled.—Dr Struthers and Mr Barlow were appointed to examine and report on this communication, which will appear in detail in a future report.

VARIETIES.

CHARCOAL CUSHIONS FOR DEODORIZATION.

A. S——, a patient under my care in the Hackney Union Infirmary, has for some time "passed every thing under her," and thereby become a nuisance and cause of complaint to the other patients in the ward. Eleven days ago, I adopted the plan of placing beneath her a calico bag two feet square, partially filled with Irish peat-charcoal, so as to form a sort of cushion and absorbing medium. It has had the happy effect—which continues even now, without any necessity for changing the charcoal—of completely neutralizing all unpleasant odour; and if the bed becomes partially wet, all the offensive ingredients are absorbed and neutralized by the charcoal, which thus is a most simple means of remedying a great nuisance, and one that requires the most strict attention at best to prevent; and that attention is often difficult, and always expensive, to procure. In cases of incontinence of urine particularly, and indeed all attended with fœtid discharges, cancer, compound fractures, &c., this plan, or some modification of it, might be adopted with advantage. I have been informed that some of the same material has been placed in the urinals of the South-Western Railway, with equally good result, in the prevention of unpleasant odour; and that even after it has been unchanged for some weeks, the fluid that percolates has been found, by chemical analysis, to contain little or no trace of the organic or saline products of urine. The fact induced me to try it as above. An argument in favour of its adoption in hospitals and lunatic asylums is, that the peat, after its deodorizing properties are exhausted, becomes more valuable for the purpose of manure, so that its use is without expense.—*Mr Howell, in Lancet and Dublin Medical Press.*

THE "MEDICAL TIMES AND GAZETTE."

We stated in our Number of *Feb.* 1*st*, that a letter sent on the 19*th January*, by Mr Syme, for publication in the "Medical Times and Gazette," had *not* been inserted.

On the 31*st January*, the editor of the united Journals *did* publish Mr

Syme's letter—a tardy act of justice which we had ceased to look for at his hands, and which we of course had no opportunity of acknowledging at the date of our last publication.

PUBLICATIONS RECEIVED.

Lectures on the Diseases of Infancy and Childhood. By Charles West, M.D. 8vo. London: Longmans. 1852.

Medicina Mechanica, or the Theory of Active and Passive Manipulations and Exercises considered as a branch of Therapeutics. By John W. F. Blundell, M.D. London: Churchill. 1852.

The Descriptive and Surgical Anatomy of the Arteries. By Joseph Henry Corbett, M.D. London: Taylor, Walton, and Maberly. Dublin: Fannin & Co. 1852.

On Rupture of the Perineum, and its Treatment. By Isaac Baker Brown, F.R.C.S. London: Churchill. 1852.

The Dictionary of Domestic Medicine and Household Surgery. By Spencer Thomson, M.D. Part I. London: Groombridge and Sons. 1852.

Notes on Bright's Disease of the Kidney, as observed chiefly in the Clinical Ward of the Jamsetjeebhoy Hospital. By C. Morehead, M.D. (Reprint from Transactions of the Medical and Physical Society of Bombay, No. X.)

Observations with Hutchinson's Spirometer. By C. Radclyffe Hall, M.D. Worcester. 1852. (Reprint from Transactions of Provincial Medical and Surgical Association.)

Thomson's Conspectus of the British Pharmacopœias. Edited by Edmund Lloyd Birkett, M.D., Cantab. (Sixteenth Edition.) London: Longmans. 1852.

Medical Directory for Ireland—1852. London: Churchill. 1852.

Pathological Anatomy in its Relation to Medical Science: Address delivered at the Royal Cork Institution. By Thomas S. Holland, M.D., &c. Cork: Bradford & Co. 1852.

Medical Directory for Scotland. London: Churchill. 1852.

Notes of Lunatic Asylums in Germany and other Parts of Europe. By W. F. Cumming, M.D. London and Edinburgh: Churchill, and Maclachlan & Stewart. 1852.

Report of the Glasgow Infirmary for 1851.

Pharmacy.—A Bill for regulating the Qualifications of Pharmaceutical Chemists. (Prepared and brought in by Mr Jacob Bell and Mr Ewart.) Ordered by the House of Commons to be printed. 12th February 1852.

Report of the Manchester Royal Lunatic Asylum, Cheadle, Cheshire, for 1851-2. Manchester. 1852.

Journal of the Statistical Society of London. Vol. XIV., Part IV. London: Parker. January 1852.

Researches and Observations on Scrofulous Diseases. By Thomas Balman, MD. London: Longmans. 1852.

On the Diseases of the Bladder and Prostate Gland. By William Coulson, Surgeon to St Mary's Hospital. 4th Edition. London: Churchill. 1852.

Erratum.—In our February Number, p. 105, line 9th, the sentences commencing with "It may be here remarked," and terminating at line 19th with the word "furnished," should have appeared as a foot-note.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Observations on Hepatic Abscess.* By JOHN TAIT, Assistant-Surgeon Madras Retired List, H.E.I.C.S., Surgeon, Dunse.

(*Read to the Edinburgh Medico-Chirurgical Society, 3d March* 1852.)

THE formation of matter in the liver is preceded in different instances by very different degrees of inflammatory action. In some cases the symptoms are of a sthenic, in others of a subacute, character; and a third class of cases occurs, where the premonitory signs, having reference to the liver, are wanting. It is regarding the two latter forms, in connection with tropical dysentery, that I beg to make the following observations.

The complication of hepatic abscess with dysentery manifests itself in two ways. In the first, there is pain and tenderness on pressure over the right hypochondrium from the commencement of the dysenteric symptoms, with local fulness, inability to lie on the left side, some irritability of stomach, pain in the right shoulder, and a yellowish suffusion of the skin and conjunctivæ.

The second variety occurs in a more obscure way. There is often not the slightest pain, or sensibility to pressure, over the region of the liver; while the right side, instead of being full, may be remarked to partake of the attenuated condition of the abdomen, which is common to the advancing stages of severe dysenteric attacks. The general symptoms, in fact, give no indications of the impending formation of hepatic complication, and the usual course in which the phenomena are evolved is the following:—

A patient, who is approaching to convalescence from acute dysentery, will inform his medical attendant that he has had a severe shivering fit, or, as he often expresses it, "an attack of ague," and that this coldness was succeeded by a hot and sweating stage. The bowels become less irritable, and the product of secretion from them assumes a feculent frothy character, in which few or no traces of its former slimy condition can be detected. On minutely inquiring into the state of the liver, pain will now be usually discovered on pressure; and on comparing the two sides, an unnatural fulness

over the right hypochondrium may be remarked. This prominence becomes daily more apparent, the stomach sympathises with the local affection, the breathing becomes difficult and accelerated, and the fermented stools keep pace with these symptoms, until the tumefaction becomes so great that a bulging of the upper third of the right rectus muscle takes place;[1] and, unless the collected matter finds an outlet either by natural or artificial means, which may lead to the recovery of the patient, he speedily sinks under the hectic irritation induced.

This is a faithful portrait of the way in which this fatal affection has disclosed itself in all the cases that have come under my notice. From what has been said of the phenomena pertaining to the second variety, it will be observed, that the chance is a remote one of our being able to discover hepatic complication through the agency of the general symptoms, until purulent matter is formed.

Where the complication under review evidences itself by the intensity of the local symptoms, we can have no better grounds upon which to base our treatment; but in those cases where the signs of purulent deposition form the first and only harbinger of this perilous complaint, it behoves us to look beyond the outward symptoms, with the view of detecting the affection of the liver in its incipient or inflammatory stage, as it has been proved by Drs Budd and Parkes that hepatic abscess is not coincident with, but consecutive to, the dysenteric symptoms.

A glance at the anatomical relations of the liver will show, that its ligamentous connection admits of an easy and but partially resisted expansion upward, during an augmented capacity of the viscus, and it is its pressure in this direction that furnishes us with the earliest signs of advancing disease in the organ, in the obscure cases before noticed.

When the liver becomes enlarged, it pushes up the diaphragm, and impedes the right lung more or less in its movements. The indications which the stethoscope affords of this effect of hepatic disease resolve themselves into negative signs, and those produced by mechanical interference with the functions of the lung.

In order to estimate aright the physical signs which lead us to suspect disease of the liver in its earliest stage, it is necessary for the practitioner to make himself fully acquainted with the force and extent of the respiration presented by the patient on his being first placed under treatment. The expansion of the lungs in a healthy state is modified so much by the form of the chest, &c., that no specific limits can with propriety be defined as to where the vesicular murmur becomes inaudible; but having from day to day ascertained the exact site over which the respiration extends, any deviations from the natural expansibility of the lungs are more

[1] The bulging of the rectus muscle is not always present, general prominence of the side taking its place.

easily marked, and the effects of mechanical pressure interfering with the salutary performance of their functions more easily detected.

When the patient comes under treatment, if we have satisfied ourselves that the right lung is unimpeded in its movements, and if it continues unembarrassed throughout the complaint, we have good reason to infer from this negative symptom that the liver is not particularly engaged. Should we find, however, during the course of the dysenteric attack, that the lung on the right side becomes more constrained in its movements, that the vesicular murmur is but imperfectly developed in the lower lobe on its dorsal and anterior aspects, with slight but progressive dulness on percussion from below upwards, that throughout the remainder of the lung the breathing is louder than natural, then we may conclude that these symptoms are induced by hepatic enlargement. Of course, before the latter inference be drawn, it is to be taken for granted, that no *pectoral* disease can be detected to account for these symptoms.

There is one condition of the respiration which is apt to mislead in the cases under review:—The patient has generally been fully depleted, and is exhausted by the regimen, &c., he has been subjected to before the liver becomes apparently affected; hence he often labours under anemic dyspnœa, which, in its different grades, simulates closely puerile respiration. The diagnosis between this state and that induced by hepatic congestion, is to be found in the respiration of nervous debility, being short, quick, not laboured, and not generally penetrating to the ultimate ramifications of the pulmonary cells.

With reference to the relative value of the general symptoms, it may be said, that the fermented stools are pathognomonic of hepatic abscess; but then they only appear when suppuration has been established, and consequently at a time when the hope of arresting the disease in its progress has passed away. A shivering fit, or rigor, is likewise characteristic of the formation of matter; but the deposition of the latter, and occurrence of rigor, seem to be simultaneous. Pus is occasionally observed in the urine. There is, however, the same objection here; it is a consecutive symptom. On the whole, therefore, the physical signs furnished by the stethoscope, in the initiatory stage of hepatic complication, must be considered as a valuable means of diagnosis in those cases unattended by pain or outward evidence of existing local disease.

It was supposed by some eminent writers on tropical dysentery, that the induction of full mercurial action upon the system was the best preservative against the inflammatory action of the liver ending in abscess; and some have considered that the two states are incompatible. I have myself frequently witnessed the contrary; and, indeed, so often have I seen hepatic abscess occur at the time the system was fully under the influence of mercury, that I was in the habit of disregarding salivation, as affording any decided pro-

phylactic safeguard against the deposition of matter. But, although mercury is not infallible in this disease, it ought always to be given after suitable depletion, with the view of controlling the inflammatory action, and soliciting the absorbents to take up the interstitial effusion of lymph, which forms the most insuperable object to be overcome, in the low and protracted cases of inflammation of the liver, tending to the formation of abscess.

As soon as the signs described in a former part of these remarks lead us to suspect that the liver is engaged, leeches applied and repeated, according to the urgency of the symptoms, afford the most reasonable prospect of subduing the disease ; and the employment of mercury, with the extract of taraxacum, may be suitably conjoined. In all these cases there is great local congestion ; and I have known a pain which had resisted every treatment, give way to the introduction of the exploratory needle. The discharge of blood following the puncture was so trifling, that I was induced to ascribe the relief so obtained simply to the breach made in the tense peritoneal covering of the liver, as it is well known that membranes of this kind give rise to excruciating pain when they become inflamed, and more particularly when tension co-exists with this state. The diluted nitric acid, and nitro-muriatic acid baths, are useful after the other means recommended, and counter-irritation is almost always indicated.

After we have palpable proofs that matter has formed, the question arises,—In what cases ought the evacuation of the pus to be attempted ? It is well known that a rupture of the abscess through the lungs is attended with great danger, although I have known recovery where this has taken place. The discharge of the matter into the bowel is the most safe outlet; and I recollect of an instance where the pus was absorbed into the circulation, eliminated by the kidneys, and the health was re-established.

When the abscess produces great distress and irritation, by its mechanical pressure, when the functions of the lungs and stomach are seriously affected, it then becomes imperatively necessary to give relief to our patient by withdrawing the matter. It appears to me that the little success attending puncture of the liver is in some measure to be attributed to the period at which it is performed,—it is not usually undertaken till the abscess is "ripe." At this stage the walls of the abscess are thin and impoverished ; their interior is lined with an imperfect coating of preservative lymph ; as may be expected, the purulent matter is ill-conditioned, and an approach to laudable pus is rarely observed. It is very difficult to obtain a healthy secretion from such abscesses, and adhesive union between the opposed walls is seldom effected to such extent as to obliterate the cyst.

At an early period of suppuration in the liver, the incrustation of lymph which is deposited on the walls of the abscess is of firmer texture than that which is found at a more advanced period ; and

it appears to me, that the operation, when performed with this condition of parts, is more likely to be attended with a successful issue, than when it is delayed until the confined matter has exerted such pressure on the conservative lymph, as to deaden its vitality, and render it less prone to take on a healing action. Moreover, at an early stage of hepatic abscess there is great tension and congestion of the liver; and the introduction of the trocar will do more to relieve the existing fulness of the organ than all external remedies together.

Some medical men fancy that there is a risk of effusion into the peritoneal sac, and inflammatory action following the puncture. This is obviated by making the patient lie on, or towards, the side tapped, the canula being retained until the adhesive lymph is thrown out round the track of the perforation. I have myself operated several times, and have witnessed the performance of puncture frequently, without ever once seeing extravasation follow.

Dunse, 16th January 1852.

Article II.—*On the Registration of Causes of Death in Public Institutions and in Private Practice.* By W. T. Gairdner, M.D., Pathologist and Assistant-Physician to the Royal Infirmary of Edinburgh.

(*Read to the Medico-Chirurgical Society of Edinburgh, January* 7, 1852.)

The subject of the registration of deaths is one confessedly of great importance, and of no inconsiderable complexity. I need not inform the Society, that it has engaged the attention of many of the most respected members of our profession, and, in particular, that the system fixed by the authority of the Registrar-General upon England, has been met in Edinburgh by a free criticism, which, though unsuccessful in its immediate object, will undoubtedly engage the most serious consideration of future legislators. I shall not need, therefore, in the remarks which I have to make upon the subject, to apologise at any length for suggesting innovations upon an established method; though these might, under other circumstances, seem to be inexpedient, or even presumptuous, when brought forward as the result of individual experience. Neither shall I think it necessary to trouble the Society with any detailed observations as to the system necessary to be pursued, in the event of an act being obtained from the legislature for the registration of deaths in Scotland, but shall confine myself to the suggestion of reforms within a much more limited circle, though not, I think, on this ground, less calculated than a public measure to advance the great aims of medical and pathological science. My object in the present paper, is to call the attention of medical men to the advantages to be derived from the systematic registration of causes of death in private practice and in public institutions, whether by the agency of indivi-

duals, or of voluntary associations, like the Medico-Chirurgical Society of Edinburgh; and to suggest means by which the co-operative labour and resources of the members of this Society, and of others like it, may be directed to purposes of incalculable public usefulness, without the excessive centralisation and the (necessarily, perhaps) somewhat despotic interference of state machinery.

I shall best explain the end which I have in view, and at the same time justify the proposition I am about to submit to the Society, by a reference to the mode of registration pursued in the Royal Infirmary, and the modifications which the most careful consideration of this subject has induced me to carry out with regard to a certain proportion of the deaths in that institution,—viz., those falling within my own department as superintendent of morbid anatomy.

Since the year 1841, the managers of the Royal Infirmary have published, in the form of an appendix to the reports of that institution, a series of statistical tables, exhibiting, in a condensed and systematic form, the results of a general register, in which the cases admitted, their age, sex, occupation, &c., are inscribed, together with the disease for which they were treated, and its result in cure, relief, or death. The labour attendant on the first attempt at a correct analysis of the three or four thousand miscellaneous cases that annually fill the beds of the Royal Infirmary, was necessarily of no ordinary character; and it is only one additional proof of the late Dr John Reid's devotion to medical science, and of the eminently conscientious character of all his labours in its behalf, that, while holding the office of superintendent of the Infirmary, he voluntarily undertook a task so full of drudgery, and so certain to be ill-requited by fame. Nor was the promptness with which this voluntary labour was undertaken less remarkable than the complete and business-like manner in which it was executed; a study of the report by Dr Reid of the two years from 1839 to 1841 proves that amid his arduous scientific labours, and notwithstanding the efficient performance of the ordinary duties of the united offices of superintendent and pathologist of the Royal Infirmary, he found time to maintain an unwearied watchfulness over the details of the register, the accuracy of which, so far as accuracy could be attained under the system pursued, may be considered as having been checked at every point by the vigilance and pathological experience of the superintendent.

The statistical tables of the Royal Infirmary, as originally published by Dr Reid, contained a classified analysis of the entire general register (chiefly according to an anatomical arrangement of diseases), indicating in regard to each disease in the register, the number of cases admitted, the results of treatment, the mortality per cent., the average residence in the hospital; and separating, in regard to these details, the male from the female patients. To this were added other tables, in which particularly important diseases,

classes of disease, or operations, were arranged with special reference to the age of those affected, the number admitted at different seasons of the year, &c. There was no distinct or systematic registration of the cause of death in the fatal cases; and, from the notes added by Dr Reid to the various tables, we may infer that the cause of death not unfrequently differed from the primary disease; in which case either the primary disease was registered, and the disease causing death was omitted, or (probably in the greater number of cases) the latter was alone registered, and the primary disease was suppressed. To the consequences of this imperfection I shall presently advert.

Dr Peacock, who succeeded Dr J. Reid as superintendent and pathologist of the Infirmary, pursued, during the years 1841-2 and 1842-3, nearly the same general plan of registration as his predecessor. He, however, introduced what may be considered as the rudiment of a separate system of registration for causes of death. In the tables for 1842 there is one embodying the diseases presumed to have caused death in 219 cases, in which a post-mortem examination took place. This table, however, appears not to have been considered by Dr Peacock satisfactory, for in the returns of 1843 it does not appear, and in place of it there is a return of all the deaths from 1841-3, arranged on the system of the Registrar-General for England. It is not positively stated whence the information as to the cause of death, embodied in this return, is derived; an examination of the return itself shows that it is merely an adaptation of the general register.—[Since this paper was read to the Society, Dr Peacock has informed me that the reason which induced him to relinquish the special table of the causes of death in cases submitted to post-mortem examination, was "the impression, that the adoption of a common system of registration (throughout the kingdom), even though that system was not the very best that might be designed, is preferable to using different plans."]

The returns of the Royal Infirmary, from 1843 to 1847, which were compiled under the direction of my immediate predecessor, Dr Bennett, present no important modification of the plan of Dr John Reid. The general register is analysed and classified in a number of tables, and notes are added here and there, explanatory of some unusual complication or cause of death, chiefly where the disease registered appears inadequate to account for the fatal event, or where a cure is registered under some disease not usually considered curable. Dr Bennett has already on former occasions, in this Society, expressed most emphatically his want of faith in such medical statistics as those of the Registrar-General and of the Royal Infirmary; and therefore, perhaps, I need scarcely say, that in the tables published by him there is no attempt to extend the system of his predecessors by the introduction of additional details, or by a separate and independent register of causes of death.

In 1848, the office of pathologist, previously always united with

that of statist, was separated from the latter, and the preparation of the statistical tables devolved on the present treasurer and superintendent of the Infirmary, Mr Alexander M'Dougall; while the pathological department was placed in my hands by the managers. Mr M'Dougall has published two series of reports, and is at present engaged upon a third, in which, while adhering to the general principles of Dr J. Reid's system, he has carried out many most important and satisfactory improvements in detail. Indeed, I believe it may be said, that in the series of tables about to be published (for the year 1849-50) the original system of registration of the Royal Infirmary has been carried to the greatest amount of perfection which it is capable of attaining; and undoubtedly the student of hospital statistics will find in those of the Edinburgh Infirmary, especially in this last series, a far more highly elaborated series of medical facts than is presented by the returns of any other hospital in this kingdom, or probably in the world. If these returns, therefore, have hitherto been found not so useful as might be expected in the study of the laws of disease, it is either on account of the remissness of statistical students, or from some inherent defect of construction in these tables, which no attention to details can remedy.

In 1850 I was requested by Mr M'Dougall to add to his statistical return for the year 1848-9 (then about to be published) some account of the numerical results of my own department. I at first thought of doing so in the form of a register of causes of death; but perceiving that this could not be adequately effected without a previously concerted machinery, different from that of the general register, and yet embodying more than the results of post-mortem examination, I desisted from the attempt, and contributed to the statistics for that year simply a classified catalogue of the morbid appearances found in 250 examinations, illustrated by notes, but registered without reference to their nosological importance. A statement of this kind has never, so far as I know, been published in the records of any hospital or private practice; and the one in question contains, as I am well aware, numerous imperfections, unavoidable in a first, and probably not to be adequately avoided even in some subsequent, attempts. But, considered merely in the light of a full index, open to the public eye, bearing on a series of careful records of the anatomy of disease, I believe that the value of this table justified its publication; the more so as it has led to changes in the mode of arranging the voluminous manuscript records of the pathological department, which will render them more accessible for future investigations than any others of equal extent with which I am acquainted.

During the last year, my attention was again turned to medical registration, and to the improvements of which it is susceptible, by the formation of a committee of managers and medical officers of the Royal Infirmary, for the review, with a view to improvement,

of the system there pursued since 1841. Finding that this committee (of which Dr Alison is convener) was fully impressed with the deficiencies of the present system, and prepared for extensive changes in it, I determined to commence in the pathological department an experimental registration of causes of death, which, if found to be as manageable and useful as I anticipated, could afterwards be connected with, or incorporated into, a more general plan. The system which I determined to adopt was only matured after many experiments and much consideration of the facts with which I had to deal, as well as of all the documents published in relation to the system of the Registrar-General; and although it differs in some respects from any plan yet submitted to the profession, I am induced to think it not unworthy of the consideration of the members of the Society, from the fact, that it has now been in full operation since October, during which time I have been able to satisfy myself both of the ease and simplicity of its working, and of the important purposes which it is fitted to carry out when employed on a somewhat larger scale than at present. And it is chiefly with a view to obtain the co-operation of the members of the Society for this purpose that I have thought it right to trouble them with this communication.

I shall now explain very shortly the general principles which I have thought it right to follow out in the registration of causes of death in the Royal Infirmary. The same remarks will, with few exceptions, apply to any system of registration of *diseases treated* in public institutions or in private practice; only that the latter will necessarily require the introduction of numerous details of disease not admissible into the former.

The first and most important observation which occurs to me on this subject is, that the practitioner should not be subjected to any limitation in regard to the number of facts he may think it important to register. Disease is usually a very complex phenomenon; and the causes of death in disease, though not usually so numerous as the entire morbid phenomena, are often sufficiently so to form a curiously-linked chain, which the rational observer will justly desire to preserve in its integrity, and not to weaken and mutilate by the arbitrary separation of one or two of its elements. Thus, to take a very common case—a patient long affected with Bright's disease, and its most common complication—dropsy, may be carried off by hydrothorax, pleurisy, pneumonia, pericarditis, diarrhœa, or coma, or perhaps by such a combination among these disorders as shall render it difficult for the medical attendant to say with certainty which of the complications was the direct cause of the fatal event. And, supposing that pericarditis and pleurisy have been the actual direct causes of death, it is obviously opening up a wide field for error to register these to the exclusion of Bright's disease, or *vice-versa*. According to the Registrar-General's system, the medical

attendant is permitted to state several causes of death; but, in the general statistical returns, only one of these can be inserted, and must of course be selected arbitrarily by the registrar. The same is the case in the Royal Infirmary, where the physician may give a primary and one or more secondary diseases, while only one of these can find its way into the classified returns, unless in the awkward and useless position of a note. I may add, that I am not aware of any general system of registration proceeding on a less exclusive principle.

In the system which I have adopted, the statement of causes of death is *left entirely unrestricted;* and the practitioner is even invited to enter his case under a plurality of headings, in the confidence that each of these will be independently dealt with in the register. It is thus expected that, under Bright's disease, pleurisy, pericarditis, phthisis, &c., we shall secure *all the cases* in which these affections were distinctly understood by the medical attendant to be directly or indirectly causes of death; whereas, according to any other mode of registry, it is evident that only a fractional number, and what is worse, an *arbitrarily selected* number, of these cases can be found under its own proper heading. The only objections which, as it appears to me, can be made to this very important improvement, are the multiplication of details, and the sacrifice of the convenient numerical correspondence between the deaths and the causes of death, which exist in the Registrar-General's tables, and in the other registers mentioned. To these objections I think it may be satisfactorily answered, that, while this multiplication of details and sacrifice of convenience is absolutely indispensable to secure even moderate freedom from error, it is not in reality found to complicate seriously the labour of a well-arranged register.

The second remark which I would make, as to the true principle of registration of deaths or disease, is, that the nosological classification employed should be such as to adapt itself at once to the most vague and the most precise information. It is obviously impossible that all cases of disease should be observed with equal precision, even by medical men. A long or a short attendance; full or deficient information from the patient or the relatives; different degrees of professional knowledge; absolute difficulties and uncertainties of diagnosis; the performance of a post-mortem examination, and the care employed in this duty,—are all so many circumstances tending to introduce variation into the results, which can only be in a measure met by having a *variety of headings, even for the same disease.* Thus a single case of disease of the circulation might, according to the information received, be very differently registered under the following heads (to take an example):—

Disease of Circulation.
Angina Pectoris; Syncope; Dropsy.
Disease of Heart.
  Do. Rheumatic.
Valvular disease of Heart.
  Do. with Degeneration of Muscular Tissue.
  Do. with Hypertrophy and Dilatation.
Aortic Regurgitation, &c. &c.

Or a case of tubercular disease might be registered as follows:—

Disease of Respiration.
Disease of Lungs and Intestines.
  Do. Tubercular or Scrofulous.
Tubercular Ulceration of Lungs.
Hæmoptysis.
Hectic Fever; Exhaustion.
Tubercular Ulceration of Intestines.
Diarrhœa.
Emaciation; Phthisis Pulmonalis.
Peritonitis, by Perforation.

If any or all of these facts are clearly ascertained in any given case, as bearing on the fatal event, it is obviously an error to exclude them from the register; if, on the contrary, any of them are reasonably considered to be uncertain, it would be equally an error to hold out inducements for their insertion. The system which I propose will leave the practitioner at perfect liberty in this respect, and will assimilate and arrange whatever information he can conscientiously give, without vitiating the more detailed returns, by omission of facts so important as those above mentioned.

It will perhaps appear to some persons, that a registration conducted on the principles which I have mentioned will contain a large mass of superfluities, which will not repay the trouble of collection. Moreover, it will be said, that some of the circumstances which I propose to register are not independent diseases, but merely symptoms; such, for instance, as syncope, dropsy, emaciation, hæmoptysis. To the latter objection I would reply, that no ideas in pathology are more vague and unsettled than those of the mutual dependence of diseases and symptoms. The *independent diseases* of one age become the *symptoms* of the next; ascites is displaced by cirrhosis of the liver; anasarca by disease of the kidney and heart; hæmoptysis by tubercle of the lung; hectic fever by a multitude of organic diseases, &c. &c., according as the more intimate study of pathological phenomena reveals new relations among facts previously to appearance unconnected with each other.

In registration, however, a little consideration will show that we may easily be too precipitate in following the march of improvement; and that it will often be a grave error, on the ground of an apparent superfluity of names, to remove from the nosology, or even

to omit in particular cases, symptoms so important as dropsy or hemorrhage. In a registration of deaths, indeed, it appears to me clear that no fact which can, under any circumstances, be clearly construed as a cause of death ought to be omitted in the register; and if not omitted altogether, it is equally plain that, to avoid error, it should be registered with uniformity in all cases where it is ascertained to be present, and to be a cause of the fatal event.

It would be easy to show that the omission of these apparently superfluous details from the Registrar-General's system has led to many gross fallacies, and in a great degree diminished the usefulness of the statistical results attained under it. Let me take one very clear and sufficient instance of this, in regard to the symptom or disease *dropsy*, to which I have already alluded. According to the Registrar-General, this is sometimes to be treated as a symptom, and sometimes as an independent disease,—a mode of proceeding which it is impossible to avoid, so long as one disease only can be admitted into the statistical tables as the cause of death in each case. But observe the effect of this partial registration. Within the last twelve years (as appears by consulting the annual summary of the Registrar-General) the number of dropsies registered has diminished by nearly two-thirds; while the number of heart, liver, and kidney diseases has very greatly increased. It is obvious, that, in the earlier years, numerous cases of dropsy were registered at the expense of the organic diseases; while, in the later, the organic affections have, to a still greater extent, robbed the column of dropsy of cases which were in reality fatal from that cause. An inference might be drawn from these returns by an unpractised statist, that, while organic diseases of the heart and other viscera had greatly increased of late years, some of the ordinary concomitants of these diseases had actually diminished,—a conclusion which would not only be absurd and self-contradictory, but probably untrue in both the propositions on which it is founded, as it is nearly certain that the apparent increase of organic affections is not the result of any more formidable cause than the improvement of medical diagnosis. The same remark will apply to the increase of organic affections of the brain at the expense of *convulsions;* and the probable substitution of many different diseases for the deaths by *old age* in the Registrar-General's return.

To all of these instances the following remark will apply; and it is one developing a most important principle in registration. Had the Registrar-General's system admitted of the registration of numerous diseases or morbid phenomena; had it invited the practitioner to state all the apparent causes of death, whether primary or secondary, whether symptoms or independent diseases, *the comparatively small variations in the numbers of certain causes of death would have been the best security against fallacious inferences from the fluctuations of others.* It would scarcely have been a tenable proposi-

tion, that heart and kidney diseases had increased in fatality, could it have been shown satisfactorily that the prevalence of dropsy had not been subject to corresponding variations; or that organic diseases of the brain had increased, if convulsions and coma had been in no degree more fatal. The system of the Registrar-General, as well as that of almost all hospitals and public institutions, presents, in this respect, no mode of checking its own unavoidable inaccuracies; and, as in all registers representing the facts of an advancing science, fluctuations must be encountered, depending not on changes in nature, but on improvements in art, I conceive that the omission of palpable and important symptoms, or even their subjection to what may be conceived to be primary diseases, is a practical error, leading almost necessarily to innumerable fallacies, and destroying the value of a large amount of statistical information.

By registering with regularity and uniformity, then, all the more important nosological conditions, all the familiar and easily-recognisable causes of death, it is intended not only to give a large number of additional and valuable pathological details, but to present to the statist a series of *fixed elements*, as it were, from the skilful use of which he will be able, as in an algebraical formula, to eliminate the actual value of those fluctuating, and as yet *unknown quantities*, which modern pathology daily furnishes to the inquirer. By giving free scope to the most detailed and scientific statements of facts, and retaining at the same time the more general and obvious peculiarities of each case, I believe that all which can be done by registration for the advancement of pathological science may be readily accomplished, without any undue complexity of system. The only sacrifice of convenience which is required, is that of the correspondence between the total number of deaths and the number of causes of death,—a sacrifice required not less by the principles which I have endeavoured to illustrate, than by the ordinary laws of nature; since every one practically engaged in the study of disease is aware that the restricted formulæ of the ordinary registers are not at all adapted to the mysterious and complex arrangements of morbid phenomena witnessed in nine out of every ten fatal cases.

Guided by these principles, and holding in view also the systems of registration, to which I have already so frequently alluded, as well as the criticisms of the Edinburgh Committee of the College of Physicians on the Registrar-General's system, I have been led to construct a table of diseases, injuries, &c., which contains, in an arrangement in some respects new, most of the elements necessary or desirable to be registered in relation to causes of death. This table I now submit to the Society, in the hope of obtaining its co-operation, in originating a system of registration among those members who may be disposed to join in furnishing data for that purpose.

Supplement to the preceding Paper, comprising a Nosological Table, with Remarks.

TABLE OF DISEASES, INJURIES, &c., FOR THE REGISTRATION OF CAUSES OF DEATH.

I.—*Cause of Death Unknown, or Imperfectly Understood* (sudden death, &c. &c.)

II.—*Injury, Privation, Neglect, Accident, &c.*

1. Mechanical violence (external).
2. Do. (internal) (foreign bodies).
3. Chemical agencies (external).
4. Poison (V.; VI.; VII.; VIII.)
5. Excessive heat (V-2; XII 9).
6. Excessive cold (V-2; XII-8).
7. Electricity (lightning) (V-2; VI-1?).
8. Intemperance (V-2, 7).
9. Starvation (IV-12, 13).
10. Neglect or mismanagement producing disease.

III.—*Surgical Operations.*

IV.—*Constitutional or General Disease.*

1. Small-pox (modified or unmodified?) (XII-11).
2. Measles (VII-11).
3. Scarlatina (VIII-8).
4. Typhus fever (abdominal typhus, VIII-14); (IV-12; V-2, 8).
5. Relapsing fever.
6. Continued fever.
7. Intermittent fever (ague) (VIII-28).
8. Puerperal fever (X-7, 12).
9. Purulent infection (phlebitis, &c.) (VI-10).
10. Glanders.
11. Hectic fever (IX-19).
12. Exhaustion or debility (asthenia).
13. Atrophy or emaciation.
14. Corpulence (?)
15. Anæmia (chlorosis).
16. Plethora.
17. Gout.
18. Rheumatism.
19. Dropsy with anasarca (general dropsy) (V-19? VI-4, 5, 6; VII-19; VIII-25; IX-9).
20. Scurvy.
21. Purpura.
22. Diabetes.
23. Syphilis.
24. Inflammation.
25. Scrofula.
26. Tubercular disease.
27. Cancer.
28. Hemorrhage.
29. Ulceration.
30. Gangrene.
31. Entozoa.
32. Premature birth (IV-12, 13; VII-1).

V.—*Disease, &c., of Nervous System.*

a. Inflammatory (IV-24).
b. Scrofulous (IV-25).
c. Tubercular (IV-26).
d. Cancerous (IV-27).
e. Rheumatic (IV-18).
f. Gouty (IV-17).
g. Syphilitic (IV-23).
h. Parasitic (IV-31).
i. Of any other specific type.

1. Concussion, or shock (II-1; V-17, 20).
2. Coma (II-4, 5, 6, 8; IV-4; V. passim; IX-1, 5, 8, 9, &c.)
3. Palsy (V. passim).
4. Convulsion, or spasm (V. passim).
5. Epilepsy (V-4).
6. Apoplexy (IV-28; V-2, 3, 4, 16, 17, 18).
7. Delirium tremens (II-8.)
8. Typhoid delirium (IV-4, &c.)
9. Maniacal delirium.
10. Monomania.
11. Dementia, or fatuity.
12. Tetanus (II-1; III.)
13. Neuralgia, and local irritation.
14. Hydrophobia.

15. Meningitis (V-*a*, *b*, *c*, *e*, 2, 3, 4, 8, 9).
16. Softening of brain, or spinal cord (V-*a*, *f*, 2, 3, 4, 6).
17. Hemorrhage (IV-28; V-1, 2, 3, 4, 6).
    traumatic.
    spontaneous.
18. Abscess (V-*a*, *b*, *c*, 2, 3, 4, 6, 8, 9).
19. Hydrocephalus (IV-19?; V-*a*, *b*, *c*, 2, 4, 8, 15).
20. External injury, with laceration (II-1; V-*a*, 1, 2, 3, 4, 17).
21. Mechanical irritation, or compression (II-1; V-1, 2, 3, 4, 5, 13).
22. Malformation of nervous system (IV-12; V-2, 3, 4).

VI.—*Disease, &c., of Circulation.*

a, *b*, *c*, *d*, &c., as in V.

1. Syncope (IV-28; &c.)
   (Sudden death from unknown cause, see I.)
2. Angina pectoris (VI-1, 3, 5, 6, 7).
3. Pericarditis (VI-*a*, *e*; 1, 2).
4. Hydropericardium (IV-19; VI-1).
5. Valvular disease of heart (VI-*a*, *e*; 1, 2).
6. Muscular disease of heart (VI-*a*, *e*; 1, 2).
7. Obstruction of coronary arteries (V-1, 2).
8. Aneurism (IV-28).
9. Varix (IV-28; VI-10; XII-12).
10. Phlebitis (IV-9).
11. Rupture or perforation of heart or blood-vessel, spontaneous (IV-28; VI-6, 8, 9).
12. Injury or wound of heart or blood-vessel (II-1; III; IV-28).
13. Air in circulation (II-1; III).
14. Malformation of the heart or blood-vessels (IV-12; VI-1; VII-1).

VII.—*Disease, &c, of Respiration.*

(*a*, *b*, *c*, *d*, &c., as in V.)

1. Asphyxia (II-2; VII. passim).
2. Asthma (VII-11, &c.)
3. Hooping-cough (VII-*a*; 2, 11, 12, 14, 15, &c).
4. Influenza (IV-11; VII-*a*; 1, 11, 12, 14, 15, &c.).
5. Spasm of glottis (II-2; V-4, 21; VII-1, 6, 7, 8, 9, 10).
6. Laryngitis (VII-*a*, *g*; 1, 5, 7, 8, 10).
7. Croup (VII-*a*; 1, 5, 6, 8).
8. Diphtheritis (VII-*a*; 1, 5, 6, 7).
9. Chronic disease of larynx or trachea.
10. Wound, injury, or obstruction of larynx, from mechanical causes (II-1, 2; VII-1, 5).
11. Bronchitis (IV-2; VII-*a*, 1, 2).
12. Obstruction of bronchi from mechanical cause (II-2).
13. Hæmoptysis (II-1; IV-28; VI-8; VII-*a*, *b*, *c*, *d*, *g*, 1, 10, 12, 16, 17, 20).
14. Pneumonia (VII-*a*, 1, &c.).
15. Pleurisy (VII-*a*, 1, &c).
16. Phthisis pulmonalis (IV-11, 25, 26, 29; VII-*b*, *c*, 1, 9, 13).
17. Gangrene of lung (IV-30; VII-*a*, *b*, 1, 11, 13, 14, 15).
18. Œdema of lung (IV-19; VII-1, 2, 11, 12).
19. Hydrothorax (IV-19; VII-*i*, 1, 15, 18).
20. Emphysema of lung.
21. Malformation of respiratory organs (VII-1).

VIII.—*Disease, &c., of Digestion and Assimilation.*

(*a*, *b*, *c*, *d*, as in V.)

1. Indigestion (IV-12, 13).
2. Vomiting (II-4; IV-12, 13; VIII-3, 6, 12, 13, 15, 16, 17, 18, 19, 24, 25.)
3. Constipation, intestinal obstruction (Ileus) (VIII-15, 16, 17, 18, 24).
4. Diarrhœa (VII-16; VIII-5, 6, 14).
5. Dysentery (VIII-4).
6. Cholera VIII-2, 4).
7. Aphthæ (VIII-11).
8. Cynanche maligna (IV-3; VIII-1).
9. Inflammation of tongue (VII-5, 6; VIII-*a*).
10. Cancrum oris (IV-12).
11. Stricture or obstruction of œsophagus (IV-12, 13; VIII-*d*, 1).

12. Inflammation of stomach (II-4; VIII-*a*, 2, &c.)
13. Inflammation of intestines (VIII-*a*, 3, 4, 5, 14, 15, 16, 17).
14. Chronic disease of stomach (VIII-*a*, *d*, 1, 2, 12, 18).
15. Ulceration or chronic disease of intestines (IV-4, 26, 29; VIII-*c*, *d*, 4, 5, 20).
16. Strangulation of intestines (VIII-2, 3).
17. Hernia (VIII-2, 3, 15).
18. Intus-susception (VIII-2, 3, 15).
19. Perforation or rupture of alimentary canal (II-1, 2, 4; VIII-14, 20, 21).
20. Hemorrhage into stomach, &c. (Hæmatemesis) (IV-28; VIII-13).
21. Hemorrhage into intestines, &c. (Melæna) (IV-28; VIII-*c*, *d*, 14; IX-4).
22. Wound of alimentary canal (VIII-18).
23. Disease of rectum (VIII-*d*).
24. Hæmorrhoids (IV-27).
25. Peritonitis (VIII-*a*, *b*, *c*, 18).
26. Ascites (IV-19; IX-4, 9; X-10).
27. Mesenteric disease (Tabes mesenterica) (IV-12, 13; VIII-*b*, *c*).
28. Disease of spleen.
29. Malformation of alimentary canal (IV-12, 13; VIII-1, 3).

IX.—*Disease, &c., of Secretion or Excretion.*

(*a*, *b*, *c*, *d*, as in V).

1. Jaundice (?) (V-2; IX-*a*, *d*, 2, 3, 4).
2. Biliary calculus (IX-2).
3. Inflammation of liver (IX-*a*, 1).
4. Chronic disease of liver (VIII-25).
5. Suppression of Urine (Ischuria renalis) (IV-4; V-12; VIII-6; IX-8, 9).
6. Retention of urine (IX-12, 13, 14).
7. Urinary extravasation (IX-12, 14, 15).
8. Inflammation of kidneys (IV-12; V-2; IX-*a*, 5).
9. Bright's disease (IV-12, 19; V-2; VIII-2; IX-5).
10. Inflammation of bladder (IX-*a*).
11. Rupture of bladder (II-1; IX-6, 7).
12. Enlarged prostate gland (IX-6).
13. Stricture of urethra (IX-6).
14. Injury or wound of urethra (II-1; IX-6, 7, 14).
15. Urinary calculus (III; V-13; IX-6, 8, 10, 11, 14).
16. Inflammation of pancreas (IX-*a*).
17. Chronic disease of pancreas.
18. Excessive perspiration (IV-11, &c.)

X.—*Disease, &c., of Generation, Pregnancy, and Childbirth.*

(*a*, *b*, *c*, *d*, as in V.)

1. Spermatorrhœa (IV-12).
2. Disease of penis, testicles, &c.
3. Menorrhagia (X-4).
4. Uterine hemorrhage (X-3, 6, 8).
5. Leucorrhœa (IV-12; X-*a*).
6. Inflammation of uterus (metritis) (X-*a*, 11, 12).
7. Ulceration of uterus (IV-29; X-4, 5, 6, 8).
8. Cancer of uterus (IV-27; X-*d*, 4, 5, 7).
9. Uterine polypus or tumour (X-4).
10. Ovarian dropsy (VIII-4).
11. Pregnancy (disease depending upon; including *abortion*) (IV-8, &c.)
12. Childbirth and sequelæ (IV-8; X-4, 7).

XI.—*Disease, &c., of Bones and Joints.*

(*a*, *b*, *c*, *d*, as before).

1. Rickets (IV-12, 13, 25 (?); X-12).
2. Mollities Ossium (IV-12, 13; X-12).
3. Caries (IV-29; XI-*a*, *b*, *c* (?), *g*).
4. Necrosis (IV-30; XI-*a*, *b*, *g*).
5. Abscess of bone (XI-*a*).
6. Periostitis (XI-*a*, *g*).
7. Tumour or chronic organic disease of bones (XI-*d*).
8. Inflammation of joints (XI-*a*, *e*).
9. Chronic disease of joints (XI-*b*, *e*, *f*, *g*).
10. Fracture (II-1).
11. Dislocation (II-1).
12. Wound, injury, or operation (II-1; III).

XII. *Disease, &c., of Integuments, &c.*

(*a*, *b*, *c*, *d*, &c., as in V).

1. Abscess or sinus (XII-*a*).
2. Carbuncle (IV-30 ; XII-*a*).
3. Erysipelas (XII-*a*).
4. Hospital gangrene (IV-30; XII-*a*).
5. Diffuse cellular inflammation (IV-30 ; XII-*a*).
6. Malignant pustule (IV-29, 30 ; XII-*a*).
7. Gangræna senilis, or spontaneous gangrene of extremities (IV-30).
8. Frost-bite (II-6; IV-30 ; XII-*a*).
9. Burn or scald (II-5 ; XII-*a*).
10. Wound, injury, or operation (II-1 ; III).
11. Cutaneous eruption.
12. Ulcer (IV-29).
13. Bed-sore (IV-29, 30).
14. Glandular swelling (absorbents) (XII-*a*, *b*, *c*, *d*, *g*).
15. Bronchocele (VII-1, 5, 10).
16. Enlarged Thymus (?) (VII-1, 5, 10).
17. Tumour, &c. (XII-*b*, *d*).

(Anasarca, see IV-19).

The above table is intended to convey an idea of an arrangement of fatal diseases, severe bodily injuries, and other obvious accidental conditions of death, which has been found to subserve the purposes of registration in the Royal Infirmary, according to the principles of the foregoing paper. It pretends to no great novelty of design, either in the naming or in the classification of individual diseases; in fact, everything which could bear the construction of theoretical innovation has been sedulously avoided; and the nosologies at present most in use have formed, in all essential points, the basis of the one which is here sketched. The adaptations which have been found necessary to meet the requirements of the scheme to which I have alluded, and which mainly distinguish this table from those after which it has been modelled, may be shortly stated as follows:—

1. The names of affections in the different sections of the nosology are followed in many instances by a series of references (within brackets) to other headings, expressive of complications, collateral causes of death, or other conditions frequently demanding registration in connection with the affection first noted. These are to be regarded as so many queries or memoranda for the practitioner in registering the causes of death according to the plan of *multiple entry* recommended in the above paper. Thus, for example, if a case of *apoplexy* has to be registered (V-6), it will also have to be generally registered as death by coma (V-2), often as palsy (V-3), or convulsion (V-4), and (according to its pathological nature) as softening of brain, hemorrhage, or possibly abscess (V-16, 17, 18). In the case of its being from hemorrhage, it will again have to be entered under constitutional conditions (IV-28); in the case of abscess it would be registered as inflammation (IV-24); and likewise as inflammatory disease of nervous system (V-*a*). These collateral facts, the statement of which, when known, is most important to science, have some chance of being preserved, and accurately noted, by being thus suggested to the practitioner; and it is scarcely necessary to attempt to point out the comparative im-

perfection of any return, in which the whole of these distinctions are merged in the general term apoplexy, or in which cases may be arbitrarily and casually placed, some under apoplexy, others under softening, hemorrhage, or convulsion, although all are equally entitled to the first designation.

2. Affections which may be really in a particular case identical, have not unfrequently more than one designation, in order to represent with accuracy different degrees and kinds of information. Thus few terms are in the present day more generally interchangeable than phthisis pulmonalis (VII-16), and tubercle of the lungs, (VII-*c*); yet there undoubtedly occur cases in which the former could with propriety be registered, although the latter is either not ascertained or not present; and, *vice-versa*, cases of tubercular disease of the lung not unfrequently occur, presenting no symptom or character of pulmonary phthisis. This important nosological distinction is entirely sunk in the Registrar-General's returns, in which phthisis or consumption is returned, not among the pulmonary, but among the tubercular diseases. Again, the terms "pneumonia" (VII-14) and "inflammatory disease of respiration" (VII-*a*), are in most cases only two names for one fact; but as instances will necessarily occur, in which the latter statement can be made, and not the former, it is desirable to preserve both the more comprehensive and the more definite heading.

3. The different orders of local diseases are placed under an arrangement according to the functions affected. This is regarded as preferable to an arrangement by organs, because it may very well happen that the precise seat of the disease, or the organ affected, may not be known, although the function chiefly involved, and even the type of disease, may have been quite satisfactorily determined. Thus, if a man dies by orthopnœa, there can be no doubt that he dies of a disease of respiration; but it may be doubtful whether the larynx, bronchi, lungs, or pleura was its seat; and if the spasmodic or asthmatic character of the disease be determined, the seat may still remain doubtful, as in some cases of tumour interfering with the respiratory nerves. To the functional arrangement of local affections there is, however, the exception of external diseases, which occupy the last two orders in the table; because in these the arrangement by organs is so convenient, and so free from all possible sources of difficulty and confusion, as to render it unquestionably preferable to the other.

4. The more important specific types of disease are arranged in a series, in connection with the general statement of disease of function. In this manner an opportunity is afforded of registering in such a way as to afford the largest amount of information in diseases the exact name or seat of which is unknown, but whose general characters are sufficiently well understood. Thus the existence of a rheumatic disease of the heart may be ascertained, while it is not

known whether it is valvular or pericardial. Such a case, if acute, would be registered—(VI-*a*, *e*; IV-18.)

5. Constitutional diseases have been made a distinct order, including a large proportion of the "zymotic diseases" of the Registrar-General, together with the diseases of uncertain seat, the tubercular diseases, and some pathological conditions not included in the nosology used in the English system. On the other hand, the order of zymotic diseases has been suppressed, as tending to remove, often upon doubtful grounds, the names of diseases from their natural associations with others closely allied to them. If, however, the separation of the presumed zymotic diseases should be considered requisite for any theoretical or practical purpose, it is easy to eliminate the elements of which the zymotic order may be considered as composed; and by doubly registering all the diseases included in that order, the object of its separation will be attained, without involving as a consequence the disintegration of others, as in the separation of croup from diseases of the respiratory system, or diarrhœa and dysentery from those of the alimentary canal.

6. The importance of registering fatal surgical operations need scarcely be insisted on; but it is curious that in the Registrar-General's nosology these find a place only accidentally, in the form of notes on the diseases and injuries for which operations may have been performed. In the above table operations form a separate order; and it is intended that all operations involving life, directly or indirectly, should be registered, without, of course, thereby excluding registration either of the diseases for which they were performed, or of the complications which may have rendered them fatal.

I have thought it right to publish the above nosological table, and the remarks upon its peculiarities and mode of use, because, from my own experience, and from the remarks of some of my professional friends, I am induced to think that the registration of private practice, both by individuals and by associations of medical men, might be carried out, with immense advantage to pathological science, far more perfectly than at present. It would encroach very little on the time, even of the busiest practitioner, to keep, in addition to such isolated facts as his note-book or his memory can preserve, a kind of scientific *ledger*, in which the important details of the mortality in his practice may be systematically analysed in the very act of being written down. Such a document includes nothing which any conscientious practitioner can regard as an undue demand upon his powers of observation; and the act of recording is so simple and so short, that the time spent upon it is scarcely greater than that involved in settling mentally the questions connected with the cause of death,—a duty which every man engaged in the responsibilities of medical practice owes in the fullest sense to his patient, to society, to his profession, and to himself. I trust that this paper may be in some degree instrumental in advancing the cultivation of scientific medicine, by giv-

ing an impulse to associated and individual effort in this direction, and leading to the preservation of important medical records of a kind that the practitioner alone can supply, and which have too often been lost to the public from real want of time in some, from indifference in others, but in many simply from the want of a right method. Upon the application of the principles I have advocated to national registration, I abstain from remarking; merely observing, that probably no national system will ever be brought to such a degree of perfection as to supersede the necessity and duty of individual and associated voluntary effort. The very selection of sources of information which the latter permits, and from which its best results are probably to be obtained, is fatal to the object of a national system. This, again, has other and most important ends, in reference to social problems which are inseparable from an advancing civilisation, and which every day assume new forms, and require new solutions. As no private collection of medical materials can accomplish these objects, it is undoubtedly the duty of the state to furnish the means of doing so as perfectly as possible; and while the more limited sphere of private enterprise may be cultivated with a view to its own special objects, it cannot but tend indirectly to the assistance and improvement of a national system, both in its method and its details.

ARTICLE III.—*On the Nerves of the Orbit.* By JOHN STRUTHERS, Fellow of the Royal College of Surgeons, and Lecturer on Anatomy, Edinburgh.

ALTHOUGH it may be said that we are now pretty intimately acquainted with the functions of these nerves, there are, notwithstanding, points about each class which are either not fully understood, or not generally agreed upon. Such are,—the relation between the motor nerves at their origin, and the meaning of their singular distribution among the muscles of the orbit as connected with the movements of the eyeballs,—the relation which the fifth pair bears to the motor nerves and the muscles of the eye, and the influence which it exerts over the parts subservient to the function of the proper nerve of vision,—the nature of certain supposed varieties in the connections of the ciliary ganglion,—and also the remarkable influence which the sympathetic in the neck appears to exert on the eyeball and on the actions of the iris. In now proceeding with this inquiry, I shall bring to bear upon it the results of a large number of dissections I have made with a special view to the elucidation of the above points; which, together with the careful consideration I have given to what has been written on the subject, may enable me to speak with some confidence when considering the views of others.

ON THE MOTOR NERVES.

The questions I propose to consider concerning the motor nerves are—1. Their cerebral connection; 2. Their relative distribution, as connected with the movements of the eyeballs; and, 3. Their connections, in the cavernous sinus and orbit, with the fifth or common sensory nerve, and with the sympathetic.

ORIGINS OF THE MOTOR NERVES.

Third, Fourth, and Sixth Nerves.—In looking to the origins of these three motor oculi nerves, we are struck, in the first place, with the fact, that they are connected with very different parts of the brain. But some anatomists hold this to be only apparent, the true origins being deeper, and such as to establish a relation between them. I shall now examine briefly into the opinions of different anatomists on this point.

The FOURTH nerve is usually said to arise from the upper part of the valve of Vieussens. Valentin[1] describes it as arising partly from the testis, and partly from the valve of Vieussens. Cruveilhier[2] says,—by one or several roots below the corpora quadrigemina, on each side of the valve of Vieussens; and, after alluding to the supposition that some of the fibres come from the cerebellum, and that others arise much deeper than the apparent origin, he adds, "all that can be seen is, that these nerves arise from the valve of Vieussens;" and he farther states, that "the nerves of the two sides are often united by some white streaks which form a transverse commissure." This nerve is believed by some to be derived from a tract of fibres which may be traced up from the olivary body of the medulla oblongata, to below the corpora quadrigemina. Dr John Reid[3] describes this tract very clearly as a motor one, and assigns this as the source of the fourth nerve. Tracing this tract upwards, he finds it to be connected with the anterior or motor roots of the upper cervical nerves, with the ninth, the sixth, the portio dura of the seventh, and the motor portion of the fifth, and, lastly, "the trochleator nerve is attached to the internal margin of the same band of fibres when it has ascended the processus a cerebello ad testes, and is about to enter the optic lobes." The same view as to the source of the fourth nerve is taken by Longet.[4] He traces part of the antero-lateral column of the cord up as a motor tract, to beneath the corpora quadrigemina, and assigns this as the source of the fourth nerve just before the tract enters beneath the testes; and he adds, "this nerve then, like the other motor oculi nerves, has an origin corresponding to its uses." Mr

[1] Encyclopédie Anatomique. Névrologie. Tome iv. p. 257. G. Valentin, 1843.

[2] Descriptive Anatomy. 1841. Vol. ii. p. 1099.

[3] Physiological, Anatomical, and Pathological Researches. 1841. P. 305.

[4] Anatomie et Physiologie du Système Nerveux. 1842. Tome ii. p. 392.

Solly, in his last edition,[1] admits the correctness of Dr Reid's description of the olivary tract, and the apparent connection of the fourth nerve with it. He adds (p. 294), "The fourth pair of nerves at their origin are connected together by a distinct commissure, more evident in some brains than in others." As to this supposed source of the fourth nerve, I shall only observe at present, that however clearly the olivary tract may have been traced up to the neighbourhood of its origin, yet no direct continuity has apparently been observed between the tract and the roots of the nerve.

Owing to the difficulty of clearing away all the pia mater without tearing off the nerve, the examination of the origin of the fourth nerve is a matter of some delicacy. It presents various appearances. Sometimes it seems in part to come out as if deeply from the testis or posterior quadrigeminal body. Sometimes it appears more to plunge down through either the middle or internal part of the processus a cerebello, a little way behind the testis; and generally, if not always more or less, it appears to pass across the upper part of the valve of Vieussens, and, joining with its fellow of the opposite side, gives rise to the appearance of a commissure. This apparent commissure has not been generally described in anatomical works, but has been noticed, in the terms already quoted, by M. Cruveilhier and Mr Solly. It is likewise mentioned by Dr Sharpey[2] that "the roots of the nerves of opposite sides are connected together across the middle line, in the form of a white band or commissure in the substance of the velum." This is a point in the anatomy of the fourth nerve which, I believe, deserves more notice than it has hitherto received. My attention was drawn to it first in 1844 from the distinctness with which I found it in some animals. It is seen usually as a distinct white band between the fourth nerves, crossing the valve of Vieussens close behind the testes, but still distinct from them. This connection seems to have given rise to the common method of assigning the valve as the origin of the fourth nerve, which seems to me, strictly speaking, not to be correct. But it is necessary first to understand the nature of this so-called *valve of Vieussens.* This thin velum is formed primarily and below of the lining membrane of the fourth ventricle, the fore part of the roof of which it forms. In some animals it is seen to consist of nothing else until we come to the commissure of the fourth nerves, but in the human brain there is, as it were, spread on the serous membrane, a thin layer of white nervous matter, overlapped behind by the grey matter of some of the small median laminæ of the cerebellum. The fibres are seen to be arranged longitudinally, and it tears in this direction when it has been hardened in alcohol. These fibres, then, have the same

[1] The Human Brain. 1847.
[2] Quain's Anatomy, fifth edition. By Mr Quain and Dr Sharpey. 1846. P. 747.

direction as those of the superior peduncles of the cerebellum, the space between which they fill up. Now, over and in front of these are added transverse fibres, gathered into a white flattened bundle, from which the fourth nerves appear more or less to arise, and forming what we shall call *the commissure of the fourth pair of nerves.* I have notes of the appearance of this commissure, from examinations made at the time above referred to, in the sheep, calf, and horse, and have seen it, I think I am correct in saying, in every brain I have since examined, whether human or among the larger of the lower animals. In the sheep, the testes, which are apart about a quarter of an inch, are joined by a white commissure, and behind this, and separated from it by a clear space, is the commissure, a line in breadth and two or three lines across, into which the fourth nerve runs on each side; and behind this the valve is again only clear serous membrane. Notwithstanding, the fourth nerve appears to arise also in part as if from the testis, and part of this commissure seems to be merely a crossing from one peduncle to the other, the whole seeming too large to pass entirely into the fourth nerve, although this may be due to its being flattened out upon the valve. On examining these parts recently in the cat, the commissure was seen to be very distinct. The fourth nerves adhere intimately to the lower and back part of the testes, and then run across into the commissure, which may be compared to the optic commissure in form, only the nerves here are more divergent in front. Two bands run into the centre of it behind, one from each peduncle; there then appears to be a union and crossing, and from this, at least the greater part of the fourth nerves passes off on each side. I have just examined these parts in the human brain in two recent specimens, hardened and prepared on purpose. In one, the fourth nerve comes by one filament from the upper part of the superior cerebellar peduncle; another comes out of the base of the testis, running backwards and outwards to join the others; and a third, the smallest of the three, evidently comes out of the well-marked commissure. The commissure is a line in breadth, the same distance behind the testes, and three lines across. It connects the upper end of the peduncles, the internal fibres of which seem to run into it, and it seems to contain more fibres than run out from it into the fourth nerves. The longitudinal arrangement of the medullary fibres of the valve is very distinct. They appear not to run into the fourth nerves, or into the commissure, but pass underneath the latter, and, collected together, mount up along the groove between the testes, and spread out on these and on the nates. On turning round the preparation, the commissure is scarcely visible, owing to the fibres of the valve passing underneath it as above noticed. In the other preparation, the longitudinal fibres of the valve partly pass beneath the commissure, but chiefly turn to each side behind the commissure, cross over the peduncle, just behind the fourth nerve, as a distinct band,

and disappear beneath the great crus cerebelli, so as to enter deeply the back part of the pons. In this preparation the largest root of the fourth nerve comes out of the commissure. Now, in neither of these do the fibres of the valve appear to run into the fourth nerves or their commissure, but the latter seems to be derived entirely from the upper part of the peduncle.

These observations appear sufficient to show that the fourth nerve is in part derived from the opposite side, and this nerve may, therefore, be regarded as composed of a decussated and a non-decussated portion. I have no theory to connect with this commissure, but dwell upon it merely as a point in anatomy which does not seem previously to have attracted much notice, or to have been understood in the light of a distinct decussation; and this, it may be observed, still leaves open the question as to the real origin or source of the fibres of the fourth pair of nerves.

The THIRD nerve appears at the inner and back part of the crus cerebri, at about a quarter of an inch in front of the deeper part of the pons. Very various accounts are given of its deeper connections. Longet[1] describes the fibres as diverging in the crus, to enter the locus niger, and be continuous with its lower fibres continued on from the antero-lateral column of the cord. He disputes the view of Zinn, that some of its fibres may be traced to the anterior commissure, and also the older view of Varolius, Vicq-d'Azyr, and Vieussens, that the third pair of nerves become united together, a supposed union to which they attributed the simultaneous action of corresponding branches of this nerve. Cruveilhier[2] traces the fibres through the inner part of the crus, diverging as far as to the pons, not farther; but he has not found any of it to come from the locus niger of the crus. Valentin[3] gives a very minute account of the origin of this nerve. He traces the fibres deeply, radiating to the nates, the superior peduncles of the cerebellum a little below the valve of Vieussens, the deep and superficial longitudinal fibres of the pons, the crus cerebri, and especially the locus niger of the latter. In one instance the fibres towards the cerebellar peduncles could be traced, he states, into the interior of the cerebellum.

Farther, Valentin, with his characteristic minuteness, describes (p. 278) an arrangement of the fasciculi, as if this nerve consisted of two distinct roots or parts where it issues from the crus,—an internal portion ("pars interna"), formed by anterior as well as posterior fasciculi, and an external portion ("pars externa"), from the inferior and internal parts of the crus, which converges on the outside of the other. The latter description appears to be correct enough, but still without authorising the inference that there are two roots physiologically distinct. The external portion arises only a very

[1] Op. cit. Tome ii. p. 378. [2] Op. cit. P. 1098. [3] Op. cit. P. 257.

little higher up, as the brain lies for dissection, and, as it were, naturally so, from the manner in which the nerve comes out, and then abruptly winds round the inside of the crus. On carefully separating the fasciculi of each portion, I found in one brain the outer portion to consist of eight or nine fasciculi, and the internal portion of nineteen. In another, the outer portion contained fifteen fasciculi, and the inner portion eighteen or nineteen. The smaller part lies at first between the greater portion and the crus, but the fasciculi of the two portions very soon unite and interlace. In fact there is no arrangement such as would have suggested to me that there were to this nerve two distinct roots, worthy of being so named and described; and I have noticed it only as Valentin has connected it with his view, founded on the result of his experiments on rabbits, that the third nerve is sensory as well as motor, from its origin.

Of the deeper connections of the third nerve, Swan[1] observes, that "its origin may be traced in the direction towards that of the superior oblique oculo-muscular nerve." Mr Solly[2] again states, that "it will be found not merely to be connected with the surface of the crus cerebri, but dipping beneath it, and there dividing into two portions;—one of these ascends through the pons Varolii to be connected with the motor tract in its passage through that commissure; the other passes through the locus niger, and splits in five or six white threads, which, separated by the gray neurine, present a beautiful appearance in a fresh brain." He then traces these filaments through the gray matter to be connected (so far as I can understand, after comparing pages 234, 264, and 294) with some fibres, which pass downwards and forwards to the crus cerebri, from the deeper part of the superior peduncle of the cerebellum. Mr Solly seems to regard the third nerve as intimately related to the gray matter of the crus, as, although he also here speaks of the distant radiation of its fibres through and beyond it, he remarks (p. 234), in speaking of this gray matter,—"This has been called the locus niger; I would rather designate it the ganglion of the third pair of nerves."

The origin of the SIXTH nerve is, as usually given, from the upper end of the anterior pyramid of the medulla oblongata, or from the groove or the pons immediately in front of this, or from both; usually by a couple of roots. The more modern anatomists have failed to trace this nerve to a deeper origin. It is usually regarded as satisfactory that it is seen to emerge from a connection with what is regarded as a motor tract.

Now, I think the preceding references and observations will make it evident that we really know very little about the deep connections or true origins of the three motor nerves of the eye; and it

[1] A Demonstration of the Nerves of the Human Body. 1830. P. 19.
[2] Op. cit., p. 293.

may likewise be doubted whether there is really anything either of truth or value in the view that these nerves are connected or related to each other by their deeper attachments. It has perhaps been too customary to regard tracts or columns, from which certain nerves issue, as necessarily having the same function as these nerves, and as in reality sending out the fibres which compose them; but now that the important physiological distinction between the gray and the white nervous matters is better understood, it may appear less bold to question the correctness of these inferences. The various tracts of white matter which compose the bulk of the medulla oblongata may be regarded as in great part simply passing through it, from the gray matter of various parts of the cerebrum and cerebellum above, to various parts of the gray matter of the cord below, or *vice versa*—commissural in their nature, and not necessarily contributing any of the fibres which compose the various nerves, cerebral or spinal. And again, the various nerves which seem to arise from these tracts in their course may be regarded as merely coming out through these tracts from certain points of gray matter. We cannot be fully satisfied with tracing a nerve to, or into, a tract—the tract itself must have an origin; but, although the association carries a certain weight with it, we must be able to follow the nerve down or into its gray matter, until we can say, physiologically speaking, that we have done with it and got it to its real origin. Thus, we are not contented with tracing the vagus nerve to the tract which occupies the side of the medulla, between the olivary and restiform bodies, but we follow it down through this to the gray matter on the back of the medulla, with which it is known to be connected.

Now, granting that the anterior pyramidal and olivary columns together form the great motor tract of the medulla, and that the motor nerves of the eye can be traced towards the upward continuations of this column, it does not therefore follow that we have ascertained the true origins of these nerves. Nor, even supposing the view just questioned to be correct, does it follow that the tracing of the three motor oculi nerves towards these tracts thereby establishes a special relation between them, or entitles us to conclude that, however distant their apparent origin, their true origins are the same; for the same line of argument would apply also to the other motor cerebral nerves. If the third is connected with the same column as the sixth, so also is the ninth or motor linguæ; and if the fourth comes out from the olivary tract, so also do the portio-dura of the seventh pair, and the motor portion of the fifth,—the motor nerves of expression and mastication.

Of the origins of the fourth and sixth nerves, then, we know nothing except the places of their apparent origin; and of the fourth also, that part of its fibres are derived from the opposite side. Beyond this, we can only suggest the probability that their fibres are connected with the gray matter in the neighbourhood of their

apparent origin. The third nerve can be traced a little deeper than its apparent origin; but anatomists are not agreed as to the extent or exact direction of the deeper radiating fibres, and we cannot say where these radiating fibres really begin. It may be doubted that they can be traced farther backwards than the crus cerebri; and when they are spoken of as going nearly as far as the quadrigeminal bodies, it must be recollected that these bodies lie on the upper and back part of the crus itself, the nates being directly above the origin of the third nerve, and at a distance only of from half to three quarters of an inch. Of the third nerve, then, we can only say, that it arises from the crus cerebri, the fibres being probably derived partly from the gray matter collected in the locus niger, and partly from some more deeply-seated gray matter in the crus.

The endeavour to trace the motor nerves of the eye to the same cerebral connection, must be therefore held to have failed; and I cannot therefore agree on this point with Mr Solly, who seems to hold that especially the third and sixth nerves have some intimate relation to each other. Of the latter,[1] he observes,—" This nerve, let it be remembered, in a physiological point of view, is merely a portion of the third, its separation from which by the pons Varolii is perfectly analogous to the separation of the roots of the spinal nerves by a blood-vessel running between them, and of no greater physiological importance." And again (p. 285), he suggests that, physiologically it would be more correct, " to consider the third pair and the sixth as merely separate roots of the same nerve, and to describe the two together by the name of the common oculo-muscular: for the circumstance of the commissure of the cerebellum separating their roots is merely accidental to their arrangement, in a physiological point of view; but the fact of their being described as if they were distinct nerves, has frequently led the student to believe that they must be endowed with distinct offices, and wonder why the abductor muscle of the eye should be supplied by a peculiar nerve, while the other muscles, with the exception of the superior oblique, receive their supply from the same source."

Should it be deemed necessary farther to show the incorrectness of the inference from such methods of description, it may be observed that, in the lower animals, these nerves are always distinct, and have the same peculiar and distant connections with the brain. In the mammalia, in which the pons Varolii is much smaller than in man, the sixth and third nerves still keep their distance from each other, not by any means coming nearer and nearer as the pons is less and less developed; and in birds, in which, as is well known, there is no pons, these nerves are still quite distinct, and do not arise proportionally at less distances from each other than they do in the human brain.

[1] Op. cit., p. 296.

We therefore retain the observation that it is very remarkable that the motor nerves of the eye should be connected with so widely different parts of the brain; and further, that while the common motor oculi nerve arises as near as possible to its distribution, the other two nerves, which supply each a separate muscle, come from very different and distant parts.

DISTRIBUTION OF THE MOTOR NERVES, AND MOVEMENTS OF THE EYEBALLS.

That there is a meaning in the peculiar distribution of these nerves among the muscles of the orbit, cannot be doubted. It is singular and constant, and is found to be the same in all vertebrate animals. This is stated by writers on comparative anatomy, and I have always found it so. The fourth nerve is never distributed to any muscle but the superior oblique, and to this muscle it always goes, although the muscle has a very different position in the three lower classes of vertebrate animals. But the sixth nerve in most mammals, and in birds, supplies additional muscles; in the latter, the muscles which move the third eyelid, and in the former, the retractor or suspensory muscle of the eye. When this muscle is single, a single division of the sixth nerve enters it; when it consists of four separate slips, intermediate to the recti, two or three delicate filaments leave the sixth to supply them. It is worthy of remark, that the part of the nerve which goes to the retractor muscle is less than a third of the whole trunk, whilst the bulk of the muscle is usually much greater than that of the external rectus.

In inquiring into the function of these nerves in connection with the motions of the eyeballs, it is necessary in the first place that we determine upon the action of the muscles which they supply.

About the actions of the recti muscles there can be no doubt or obscurity, providing it be granted, first, that each turns the eye in its own direction, and, secondly, what is equally evident, that two neighbouring recti turn the eye diagonally between them; and that thus all the diagonal as well as the direct movements are performed; a view which would never have been doubted but for the apparent necessity of discovering some use for the oblique muscles. And as to the oblique muscles, I think, from what is stated in my paper on this subject,[1] it is impossible to avoid the conclusion,—in accordance with a view which is older even than the time of John Hunter, who specially supported it, notwithstanding which it had again fallen into disrepute,—that the use of these two muscles is to perform *lateral rotation*, *i. e.*, to roll the eye on its antero-posterior axis. This becomes still more evident when we descend below the mammalia, when the superior

[1] On the Oblique Muscles of the Eye in Man and Vertebrate Animals. Monthly Journal, Oct. 1849.

oblique is seen to be no longer reflected over a pulley, but lies at the fore part of the orbit, simply as the counterpart of the inferior; and it is at once evident, not only that these two transverse muscles pull the eye round about on its axis, but also that they cannot act so as to change the direction of the axis, so as to assist or partly supplant the recti in the manner in which they are commonly supposed to do so in man. It is likewise, I think, made evident that such a motion of the eye, as Hunter supposed, is necessary, during the side inclination of the head, to prevent the impression of the object changing its place *circularly* on the retina. It is possible that, from the slight variations they present, in their point of attachment and in their direction to the axis of the eye, in different animals, they may associate their rotatory movement with a slight change in the direction of the axis. As to this I cannot speak positively, but I hold that, whatever minor actions they may or may not have, the action of these muscles is to rotate the eye on its axis; that, in short, this is the purpose for which they were provided. I arrived at this conclusion chiefly from the consideration of their comparative anatomy, and since then, I find additional evidence of the correctness of this view from the writings of Jacob and Longet, without reference to comparative anatomy, which are deserving of notice here also from their bearing on the subject of paralysis of the motor nerves of the eye. Dr Jacob, in a very instructive paper on the muscles and nerves of the eye,[1] observes, "The two oblique muscles, not running from the inside of the orbit directly outward, but inclining backward, until they become attached to the posterior part of the eye, not only cause the sphere to revolve on its longitudinal axis, but probably change the direction of that axis; the inferior directing the cornea perhaps a little upward and inward, and the superior a little downward and outward. I have, however, great doubts as to the actual production of this effect. That the inferior oblique causes the eye-ball to revolve round its longitudinal axis, may fairly be inferred from its attachments, but that it alters the direction of that axis in any considerable degree, cannot be so easily admitted. We cannot observe the action of this muscle distinct from that of the others, but we can that of the superior oblique. In cases of paralysis of the three straight muscles, the inferior oblique, and the elevator of the upper lid, from disease affecting the third pair of nerves, the action of the abductor supplied by the sixth nerve, and of the superior oblique supplied by the fourth, remains unimpaired. The patient, unable to raise, depress, or turn in the eye, or elevate the upper lid, turns it out as effectually as ever, when directed to do so; and when directed to look downward, the

[1] On Paralytic, Neuralgic, and other Nervous Diseases of the Eye. By Arthur Jacob, M.D. From the Dublin Medical Press. January 6, 1841. P. 8.

action of the superior oblique is clearly distinguished. It is a delicate rotatory motion, with perhaps a very slight inclination downward and outward. Of this I have now no doubt, having repeatedly within the last two years observed it, and pointed it out to the students." And, again, in connection with a case of complete paralysis of the muscles supplied by the third nerve, he observes,—"On directing her to look down, the eye is distinctly twisted from the nose toward the temple without any visible direction of the pupil downwards. It is a mere rotatory motion." Longet[1] refers to several writers as having held this view regarding the action of the oblique muscles :—MM. J. Guerin, 1840; Huech, 1841; Helie, 1841; and more especially to M. Szokalski, who has written a memoir on the subject.[2] The nature of the motion seems to be very clearly apprehended by them, and they appear to see the necessity for this motion when the head is inclined from one shoulder to the other, the eyes being kept fixed on some object. Longet also refers to M. Berard's view that, in this case, the superior oblique of one side will act at the same time as the inferior of the other side; and adds that "it does not seem to me to be possible to perform voluntarily the rotatory motion of the eye, of which we spoke above, when the head is fixed."

In connection with the point now under consideration, I shall next refer to the subject of *paralysis of the fourth nerve*, or superior oblique muscle. For doing so here I need offer no apology, as the subject is one regarding which very little is known. Those who look for the symptoms of paralysis of this nerve to accord with Sir Charles Bell's now abandoned theory that the muscle is concerned in an involuntary upward motion of the eye, must necessarily be mistaken; but more generally paralysis of the fourth nerve is passed over as a subject of which nothing is known, whilst the symptoms of paralysis of the third and sixth nerves are simple and well understood. The only writings bearing directly on the subject of paralysis of the fourth nerve, with which I have met, are those of Dr Jacob and M. Szokalski as quoted in Longet's work. Dr Jacob's remarks scarcely admit of condensation. He observes[3]:—

"Paralysis of the superior oblique muscle has not been noticed, because it is not easily detected. I have already said that I believe the action of this muscle to be very delicate, and confined to communicating a slight rotatory motion to the eye. The grounds upon which I have arrived at this conclusion are, repeated observations of cases of paralysis of the other muscles, from diseases of the third. It must, I think, be admitted that when the levator, depressor, adductor, and inferior oblique muscles are paralysed, the eye must remain fixed, unless moved by the abductor, or superior oblique. That this is

[1] Op. cit., p. 396.

[2] De l'Influence des Muscles Obliques de l'œil sur la Vision, et de leur Paralysie. Paris, 1840.

[3] Loc. cit., p. 19.

the case, an attentive examination of an eye affected with what is commonly called *ptosis* proves. The eye is turned out by the action of the abductor, supplied by the sixth nerve, as perfectly as ever, and when the patient is directed to look downward, or toward his shoulder, the cornea is seen distinctly to revolve, with little if any depression of the pupil. In other words, the eye-ball is turned round its antero-posterior, or longitudinal axis. In this I think I cannot be mistaken, as I have repeatedly called those about me to observe the fact, in order to bear testimony to it. I have alluded above to a case in the city of Dublin Hospital, in which the four straight muscles of the eye, with the elevator of the upper lid, and probably the inferior oblique, were paralysed from disease of the third and sixth nerves within the skull, and in which this delicate rotatory motion was obvious. If the action of the superior oblique be to turn the eye downward and outward in a considerable degree, there could be no difficulty in demonstrating that action, in the case of the other muscles to which I allude; yet this cannot be done, but on the contrary the delicate rotatory action to which I allude is the result of the effort. The next question, however, is, whether paralysis, either sudden or slow, of the superior oblique, takes place or not; and this question is not, I admit, so easily resolved by demonstration. One thing must, however, be admitted, and that is, that it is most improbable that this superior oblique muscle, and the fourth nerve which supplies it, should be exempted from disease or its consequences, while the other nerves and muscles so frequently suffer. On the contrary, looking at the remote origin of the nerve, the length of its course, and its small dimensions, we should rather expect to find it more frequently engaged than any of the rest. If the action of the muscle be what I say it is, it is no wonder that paralysis of it should be difficult of detection, while all the other muscles are in a state of activity. Its loss is not perceived in the multiplicity of other motions. There is, however, I think, good grounds for supposing that the consequences of such paralyses are occasionally evident. There are certain cases of anomalous and unintelligible defects of vision, which can scarcely be accounted for in any other way than by attributing them to this cause. I allude particularly to double vision with great confusion of sight, and with little or no squint."

Dr Jacob then refers to several such cases. One patient had double vision. When he looked downwards, he lost sight of objects, while he saw well enough on looking upwards. He saw quite well with either eye singly. In three cases the patients saw near objects correctly, but those at some distance appeared double. Another where vision was good with one eye closed, but imperfect when both were open; and it is not stated that there was any squint. Dr Jacob farther states that he has met with many similar cases; but, not taking this view of them at the time, did not pay that attention to them he now would. Although I have thought it right to quote the points of interest in these cases, which the author merely suggests might possibly have been of this nature, yet they do not strike me as exactly the symptoms which we would expect to arise from want of action of the superior oblique muscle.

According to M. Szokalski,[1] paralysis of the fourth nerve is rare as a separate condition; but he has seen it several times along with paralysis either of the third or sixth pair. He relates two interesting cases, which I shall translate entire:—

[1] See Longet's work already quoted. Vol. ii. p. 399.

Case I.—"The eyes of the patient have no trace of lesion, their mobility is in no way constrained, and they can be directed easily to all sides, which proves that there is no anomaly in the straight muscles of the two eyes. The two pupils are of equal size, and equally dilatable. Nevertheless, the centre of the *left* cornea manifests a tendency to be placed a little lower down than the right; there is double vision, and constantly *one image of the object is placed above the other*. If the right eye is shut, the upper image disappears; if the left eye, the lower image ceases to be visible. The two images resemble each other always so exactly, that the patient learns only by judgment and habit, that the inferior is false. When the head is inclined to the left, the images separate more and more; but if it is inclined to the right only one image is seen. Since I have pointed this out to him, adds M. Szokalski, he goes with the head inclined to the right; formerly he managed by keeping one eye shut."

Case II.—"An attentive examination showed to M. Sichel and myself, that the two eyes are perfectly moveable in every sense. The patient states that every object seems double to him, in such a manner that he perceives two images, *the one above the other;* these two images separate in proportion as he retires from the object; the lower image appears less distinct. Some vessels were found injected in the external corner of each eye; we looked carefully whilst we moved the patient's head alternately to the left and to the right, holding it by the temples, and we remarked then that *the left eye remained attached to the wall of the orbit, which followed the movements of the head,* whilst the right eye underwent a rotatory movement in the orbit. The patient was astonished to see single when he inclined the head to the right."

"It appears impossible," says M. Szokalski, "to explain these phenomena otherwise than by paralysis of the left superior oblique muscle." And M. Longet concludes—"According to these observations of M. Szokalski, the symptoms of paralysis of the fourth nerve are the following:—1. The impossibility of the rotation of the eye in the orbit. We recognise that impossibility when the patient is directed to bend his head alternately from side to side, while he keeps his eyes fixed on some object; we see then that the affected eye remains fixed, and that it does not follow the rotations of its fellow. 2. There is constantly double vision, and the two images are placed *one above the other;* the affected eye furnishes the lower image. 3. The double vision disappears when the head is inclined to the side away from the affected eye."

Now, if the report of these cases is faithful, and they seem very circumstantially related, they form a very interesting contribution to the subject of paralysis of the fourth nerve. Since my attention was drawn to this subject, I have not had an opportunity of verifying or testing these observations; but, looking theoretically to the matter, I should think that the passive state of the eye, whilst the head was being bent to the side, would require to be carefully looked for, to be noticed. According to our view of the action of the oblique muscles, when the head is bent over to the right, the right superior oblique and the left inferior are in action, so that the upper part of the right eye is turned round towards the inner canthus, and the upper part of the left is turned round towards the outer canthus, so as to counteract the chiefly circular displacement which the picture would otherwise undergo on the retina. Now, were the movement a purely rotatory one, without the least depression or elevation of the axis, we should expect to find, not double vision with one object above the other, but confused vision, one image of the object being across the other; that, for instance, a pencil, held up, should appear more or less like a cross. But as a

purely rotatory motion, without any change in the direction of the axis, would be required only if the head was being bent round on an axis exactly corresponding to the axis of the eye, which can never be exactly the case, at least with both eyes at the same time, we can readily understand why the oblique muscles, whilst they roll the eye round, may be employed also slightly to alter the direction of its axis, and why therefore paralysis of one of these muscles should cause double vision with separated images, unless when its antagonist on the same side is in action; that is, for instance, why paralysis of the right superior oblique should cause a second image to appear, belonging to the right eye, when the head was bent over to the same side, or unless when it was turned to the opposite side. Just in the same way as, in paralysis of the right sixth nerve, the patient has double vision when he looks to the right, but sees single when he looks to the left side. I cannot, however, see, still merely reasoning on the matter, why in pararalysis of the superior oblique, the false image should necessarily be situated *below* the other, because, if the superior oblique has any little power in changing slightly the direction of the axis whilst it is rolling the upper part of the eye round towards the inner canthus, it will certainly be downward; and, when the muscle is paralysed, there would be a want of this slight downward motion, and the false image should therefore be, if not above, at least not below, the other. This I infer from the experiment of causing double vision by pressing one eye in different directions. If the right eye be pressed inwards with the finger, the false image moves to the left. If the eye be pushed up, by pressing, for instance with the end of a small key, deeply between the lower lid and the orbit, the false image moves up. And if, in a similar way, by pressing in deeply between the orbit and the upper lid, the axis be *depressed*, the false image will move down, and appear *below* the one from the untouched eye, somewhat as in M. Szokalski's cases of presumed paralysis of the fourth nerve.

My object in presenting these theoretical considerations, however, is not to endeavour to prove the superior oblique not to have been affected in these cases, but to show on the one hand that this relative position of the two images, in diplopia, is not to be regarded as essential to establish the case as one of paralysis of the superior oblique, a condition which might give rise to various positions of the false image; and on the other hand, that such a relative position of two images does not necessarily, of itself at least, point to the superior oblique as the muscle affected, but might be due to a slight inequality in the action of the upper or lower recti muscles.

Before leaving the subject of our view of the action of the oblique muscles, I may illustrate it by one other reference to a diseased condition, as described by Dr Mackenzie of Glasgow,[1] under the

[1] Practical Treatise on Diseases of the Eye. 1840. P. 291

title of "oscillation of the eyeball." This oscillatory movement is rotatory round the antero-posterior axis, and is not to be confused with the oscillatory movement from side to side by the lateral recti, which is not uncommon, and has received a different name. He observes, "in oscillation the eyeball is affected with an almost perpetual rotatory motion round its antero-posterior axis. The patient is not conscious of this motion, from any particular feeling he has in the eyes, nor can he restrain it. It goes on even when the lids are closed, but it ceases during sleep. The motion varies in extent, from a scarcely perceptible degree, to perhaps nearly a quadrant. In some cases the motion seems to be rather from side to side, but often so small in degree and so rapid, that it is difficult to say what is exactly its direction. In general, it is pretty distinctly rotatory, and seems to be produced by the antagonising action of the obliqui, the recti having lost, in a great measure, their control over the eye."

(To be continued.)

Article IV.—*Medical Topography of the Western Coast of Africa.* By D. Ritchie, Esq., Surgeon, R.N.

To the philosopher, the philanthropist, or the physician, the conditions of the western coast of Africa, in relation to its adaptation to the development and maintenance of human life, must ever be a subject of deep interest. From the river Gambia to the Congo, along a coast line of about 2000 miles, presenting many varieties of geological formation, the soil possesses a lavish fertility equalled by no other portion of the globe of similar extent. The temperature, vibrating between 70° and 90° of Fahrenheit's thermometer, neither debilitates nor oppresses the mental or physical powers of the European. These circumstances would have constituted this the paradise of mankind, did not the skeletons of past generations rise in gloomy array over the desolate scene, warning away the pioneers of civilisation. The ever-verdant surfaces of nature promised those who had gone before a rich possession; but beneath its umbrageous canopy they have only found an unknown grave. Their memory, and the impress of their intellectual power, have proved alike evanescent; the luxuriant vegetation obliterates rapidly their most enduring works, and the native glides back with a natural proneness to his original debasement, the germs of progress withering in an ungenial soil.

From recent personal observations of the places of most interest to the European along this coast, I propose, in the following survey, to give a rapid sketch of its general character, and occasionally of its local influences, in averting or in generating disease. Should the labours of the scientific, or the fortunate energy of the

mere adventurer, at last triumph over these, an object of incalculable importance to the future of mankind will have been gained. This may be supposed still at a distance, but it is not the less necessary for present observers to endeavour to raise a pyramid from the top of which some fortunate genius may at last discover the way to preserve health amid these scenes.

When approaching the coast in the latitude of the river Gambia, the sea changes from the dark blue of the deep ocean into a turbid flood, teeming with animal life, and a pale leaden or yellowish tint pervades the sky. These deepen as we draw nearer the shore, until it is observed like a faint yellow streak lying on the horizon, with dark masses of primeval forest rising over it, at first resembling distant islands, but by degrees spreading out into one unbroken sheet, through which the course of the river forms the only gap. This is between three and four miles wide at its entrance, owing to the reflux action of the surf, which stems its muddy waters; further on, however, its breadth increases to seven or eight miles, and it resembles a sluggish lake, bearing on its surface myriads of small, brown, globular medusæ. The tide, which rises only six feet at its mouth, is sensibly felt above 500 miles in the interior, so level is the surface through which it winds its anfractuous way. From this to Sierra Leone, comprising a coast line of above 300 miles, the general features of the country are the same. From the mountains of Senegalia, numerous streams descend, laden with debris; these coalesce and communicate with each other as they approach the sea by numerous creeks, indicating the process of their formation, through the agency of the surf rolling back the alluvium mingled with sand upon the mouths of the rivers, thus forcing them into new channels. The intersections of these form numerous islands, which become more detached the nearer the sea and the newer the formation. Their surface is but slightly elevated above high-water mark, and the dry soil is invaded by swamps nourishing a luxuriant aquatic vegetation, in which the crocodile or hippopotamus can alone find a congenial habitation; or by stagnant pools, over which the dark mangrove throws a funereal gloom. When, however, the matted and ever vernal forest is cut down, a rich black loam, resting on a sandy bottom, is found, the fertility of which amply repays the labours of the indolent cultivator with every article adapted to his wants.

Bathurst, the first British settlement on this coast, is situated at the mouth of the river Gambia, on the hot dry sands of the island St Mary. The population consists of between thirty and forty white men, and 2000 negroes; the former is constituted by the functionaries of the colonial government, the missionaries, and individuals engaged in commercial pursuits, for which this appears an advantageous position—as the river is navigable for vessels of considerable tonnage above 600 miles into the interior, and as we

maintain a wide influence by garrisoning Barra Fort on the opposite shore, and Macarthy's Island 250 miles up the river.

In regard to its collateral conditions, no situation could at first sight appear more prejudicial to health than this,—a low island, surrounded by a broad marshy beach and almost stagnant waters. This view is, however, shown by experience to be incorrect. In no other locality along this coast is endemic disease found less prevalent or fatal.

The rainy season commences in June and terminates towards the end of September. During all this time rain is more or less frequent; but in July it occurs nearly every day, accompanied with north-westerly winds. Tornadoes are most frequent in the beginning and towards the end of this season. They always come from the eastward, and produce violent electrical phenomena. This period of the year is the most pregnant with disease. Fevers are frequent amongst the white population, and not uncommon amongst the negroes. The latter, however, suffer more from dysentery, the consequence apparently of the limited supply of good water, and the frequent use of that laden with impurities, when the system is already disposed to disease by the febrific forces existing around them. It is, however, certain that individuals may live here for years in the enjoyment of excellent health, by employing ordinary caution, without suffering from either of these. They possess no specific to account for this immunity, beyond the careful maintenance of the vital functions in a normal condition, and the steady avoidance of whatever would interfere with it.

The comparative salubrity of this place appears to arise from two causes. The first of these is the abundance of the means of subsistence and comfort within the reach of all. The second is the purity of the atmosphere, and its low temperature during the winter months.

The equatorial currents of the ocean and of the air are kept up by fresh supplies from the temperate zone. This fact is absolute as regards the ocean; but in relation to the air, which is affected by so many disturbing causes, it can only exist in a modified degree. Even in this, however, it is obviously sufficient to counteract the influence which the scorching winds from the great desert, lying in the same parallel, would produce, an influence not unfrequently experienced in the hurmattan. From these causes the temperature is kept moderate,—never reaching 90° in the hottest day, and very often descending to 70° during the six dry months; thus giving a pausing time for the system to recover from its state of exhaustion, and to eliminate or reconstruct the effete or imperfect organisms which are cumbering the vital processes, or perhaps ready to be transformed into a poisonous compound on the application of the first exciting cause.

Sierra Leone, the situation of the second British settlement, according to the order I intend to pursue in describing this coast,

comes next under consideration. It may be viewed as the terminating ridge of that lofty chain of mountains which traverse nearly this parallel of latitude, to which the names "Kong," and "Loma," have been applied. Formed of plutonic rocks, of which granite is the predominating ingredient, with quartz and ironstone in smaller but still considerable masses, it rises boldly to a height of nearly 6000 feet, overlooking the broad estuary at its foot, into which several rivers discharge their muddy waters, and the low alluvial country to the north already described.

Viewed from the sea, the general aspect of this place has been considered by most visitors beautiful, in consequence of the commanding situation of Freetown, the seat of government, which lies along an elevated slope, with the citadel rising behind it, and on a ridge still more elevated the buildings required for the residence of the troops. The shaggy mountain, covered with a brilliant vegetation, and piercing the wreaths of vapour which generally roll round its rugged peaks, forms a noble back-ground to the picture. The picturesque character of the whole is, however, diminished by the extensive removal of the natural forest, and the consequently parched appearance which the surface presents, particularly during the dry season. This may be advantageous to health, but certainly the comfort of the inhabitants would have been increased by leaving shady rows of trees along the roadsides, and perhaps even along the sides of the streets, without any deleterious influence resulting.

The British territory consists merely of a peninsula, which is surrounded on three sides by a rocky abrupt beach, broken occasionally by white sandy bays. Its rugged surface is covered by a scanty red earth, which may be rendered by cultivation remarkably productive. This is very palpably exemplified by the comfortable condition of the negroes, who have erected a number of scattered villages, at various degrees of elevation, along its shelving sides.

There is no swamp or cavity where water can remain stagnant in the vicinity of Freetown, with the exception of a narrow low valley, which lies about a mile to the westward. To this some have attributed the fatal power of propagating those fearful epidemics which have devastated again and again this place, and of impregnating at all times the surrounding atmosphere with the germs of disease, to the extent of rendering the deadly nature of this climate a proverb to mankind. Others, however, considering this source unequal to such results, have attributed them to the marshy shores of the low alluvial land to the eastward, called the "Bulloms," the nearest point of which is distant not less than five or six miles.

It is strange that men of discernment should have clung with such tenacity to the idea, that the relation of swampy exhalations to fever constituted alone that of cause and effect, when evidence

existed on every side of fever of the most fatal type prevailing in an equal degree, in situations where no marsh did or could exist, as at Fernando Po, the Ilhas dos Idolos, or in the British settlements on the Gold Coast, and in many other situations.

Evidence of a perfectly demonstrative character exists, that fevers of the most malignant kind frequently arise from exposure to emanations from animal or vegetable matters in a state of putrefaction. That this is not a universal cause is not less true; but, notwithstanding, the anxiety to discover some reason for the extraordinary prevalence and fatality of fever in this settlement, has led able men to pervert their powers of observation so far as to magnify the natural decay of a few scattered leaves or branches into pestilential hot-beds of disease. The truth is actually the reverse. The sloping sides of the mountains do not admit of accumulations of decaying vegetable matters and stagnant waters; besides, here as throughout the tropics, life predominates, and there is little of that deciduous decay observable in the temperate zone. The vegetable world is ever verdant, unless on the arid declivities, where it perishes in the dry season. It is universally known that this is not the time most productive of fevers, but that they are to be dreaded during the rains, when vegetable forms are endowed with unwonted activity, and even the putrefactive process appears to be transformed into vital energy,—new forms of organisation so rapidly succeeding the destruction of the old.

Believing, then, that these causes—marsh miasmata, or putrid exhalations—are inadmissible, in explanation of the febrific forces existing in this settlement, and equally inapplicable in many other situations along this coast, to what are they to be ascribed? The extremely variable intensity with which these forces operate, would appear to indicate that they cannot reasonably be referred to one collateral condition of the surrounding media, but that one or more must unite, with a peculiar predisposition of the internal organisation, before the effect—fever—is produced.

It may be laid down as an axiom, that fevers possessing a similar type are produced by the same causes. The endemic fever of this coast, then, being intrinsically the same disease, must arise from causes as widely applicable as the liability to it exists. In consequence of its general diffusion in localities far apart, and possessing very opposite conformations, and also the peculiar exemption which some situations and certain individuals enjoy, these may be arrived at with a tolerable certainty. They are essentially a high range of temperature; an atmosphere loaded with moisture; the neighbourhood of active vegetation or its products; an elevation not far above the level of the sea; and more than all, a condition of the system disposed to febrile action. The only method by which we can arrive at a certainty, with regard to these influences, is, by comparing the correlative circumstances in those cases where a temporary exposure, in various and definite places, is succeeded within a definite

time by febrile action. This is a necessary course to be pursued, as erroneous conclusions are apt to be arrived at, in consequence of the length of time the germs of the disease may remain latent in the system. Proceeding, then, in the inquiry upon these principles to the examination of the facts recorded, together with those the result of personal observation, the conclusion appears inevitable, that the preceding conditions are those alone essentially requisite in the production of fever.

A high temperature,—that is, a range of the thermometer between 80 and 90 degrees, has often been observed as the precursor or concomitant of the fully developed malignancy of various epidemic or endemic pestilences in distant parts of the world. That a similar temperature is necessary to the production of coast fever appears to me not less obvious. Comparatively few cases arise where this is not a concomitant; and I believe none where it has not exerted its influence as a predisponent. It is universally observed at all times and places where this disease prevails, not, however, acting alone, but always conjoined with a humid state of the atmosphere, and becoming, in proportion to this humidity, the more energetic.

From the Gambia to the Congo, the difference of temperature between the wet and dry bulbs of Fahrenheit's thermometer varies from 1 to 4 or 5 degrees, according to the season, the weather, or the latitude; but, except under the temporary influence of the hurmattan, it is never seen in the neighbourhood of the coast greater than the latter; thus indicating at all times the existence of a very large amount of aqueous vapour in the surrounding atmosphere. Towards either of the extremes mentioned above, the variation is greater than between Sierra Leone and Cape Lopez, in consequence of the breezes from the temperate zone renewing occasionally the saturated atmosphere, and in an equal degree checking the production of fever.

No doubt can exist of the deleterious influence of heat and moisture combined upon the human constitution; but nevertheless they do not in themselves appear efficient causes of the endemic fever of this coast. The cause or causes, wherever they exist, must always be equal to the production of a certain effect; this is not accomplished by these, and therefore it becomes necessary to conjoin a third power—the neighbourhood of active vegetation or its products. The actual distance to which the influence of this may extend cannot with certainty be ascertained; but it is very certain that it increases proportionally to its nearness, as the crews of vessels which cruise a few miles distant from the coast do not suffer, and the inhabitants residing on a barren situation are not liable to be attacked. It is also ascertained, by experience, that clearing the soil of its natural wood renders a locality more healthy. That the vegetable product should be in a state of decay does not appear a necessary condition to the production of the common

endemic fever, although evidence of the most convincing kind exists of its influence in exciting febrile action, and that often in the most intense form. As an opportunity will occur in pursuing the description of the coast, of more fully illustrating the influence of organised matter, I shall now proceed to the fourth co-efficient, namely, low situation. Little available evidence of the actual extent of this exists, in consequence of all the settlements made by Europeans in this part of the world being only slightly raised above the level of the sea, with the exception of Sierra Leone. There, however, the superior salubrity of the barracks, at a height of some 200 feet above the town, and, in a greater degree, of the habitations higher up on the mountain, gives countenance to the supposition, that it is only in the lower strata of the atmosphere that the germs of the disease are to be found.

These conditions of the surrounding media are universally observed where the origin of pure remittent fever can be rigorously traced. They are, however, in themselves obviously unequal to the causation of the peculiar morbid phenomena without a concomitant condition of the system disposing to these. This condition appears essentially to be a relaxation or diminution of the forces of vital affinity, induced by all those causes which tend to diminish this, by deranging the functions or the elements of organisation. Where these exist in full vigour, and uncontaminated, the febrific influence fails in producing its series of morbid transformations. It, however, retains its specific power for a period not very precisely ascertained, but known to extend from a day to a month or six weeks; yet most frequently developing itself after the lapse of eight or nine days.

What this influence *is* remains still a mystery; but, from the circumstances attending its evolution, diffusion, and development, there appear good grounds for believing it to be an organised germ generated either in the surrounding media, or in the effete or excrecrementitious matters of the system itself under the influence of these.

(To be continued.)

ARTICLE V.—*Cases of Stricture of the Urethra.* By FRASER THOMSON, M.D., Perth, Visiting Surgeon to the County and City Infirmary.

CASE I.—John ——, æt. 51, occupation a shoemaker, admitted on March 1st, 1851, on account of stricture of the urethra. The patient is a rather unhealthy-looking, and a very dissipated, man, and has suffered from his urinary complaints during the last twenty years. He attributes his disease to a gonorrhœa which he had contracted in his youth.

About twenty years ago, having been for some time labouring

under symptoms of stricture, he was seized, after a debauch, with retention of urine, requiring the repeated use of instruments for his relief. Subsequently he remained pretty free from his urinary complaints, until about between seven and eight years ago, when a return of his complaint took place, followed by retention, and the formation of urinary fistula, on account of which he sought admission into the Glasgow Infirmary, where he remained under treatment by dilatation about three weeks, when he was dismissed at his own request, the fistula still remaining open. He remained in this condition for about five years, when, suffering from an aggravation of his symptoms, he was admitted to the Dundee Infirmary, where, under the use of instruments, he was relieved, and the fistula healed up. An instrument equal in size to No. 7 catheter was the largest which could be passed at that time. He remained much better for some time. A return of the symptoms having taken place, he was admitted to the Perth Infirmary; and, on examination, stated himself to be suffering from pain during the passage of the urine, an exceedingly frequent desire to make water, and a very much diminished size of the stream. Two days after admission, the state of the urethra was examined, and an instrument of the size of No. 3 catheter was with some difficulty introduced, resistance to its passage being experienced at a point about three inches from the meatus, and also in the vicinity of the bulb of the urethra, in both of which situations induration could be felt externally, that round the anterior stricture extending over a surface of about half an inch, and that round the posterior stricture to rather more than three quarters of an inch. In front of the posterior induration is the cicatrix of the fistula, which had formerly existed. It having been decided that an attempt should be made to dilate the urethra, instruments were passed on every second day, except when their use caused much irritation, during a period of between five and six weeks; at the termination of which period little progress having been made, the division of the posterior stricture by external incision was resolved on. The operation was performed on the 7th April, under the influence of chloroform. A grooved director having been passed through the strictures, an incision, about one and a half inch in length, was made in the mesial line, and the posterior stricture divided; a No. 8 catheter was then introduced into the bladder, and retained.

The patient had almost no hemorrhage at the time of the operation, but a slight oozing from the cut surfaces during the afternoon, which was easily arrested by a cloth wet with cold water being kept applied.

The case afterwards went on favourably; the catheter was removed after having been retained in the bladder forty-eight hours; the urine continued to pass entirely by the wound for the first twelve days, and afterwards the quantity passed by the natural

passage steadily increased, the wound maintaining a healthy appearance, though contracting but slowly. The patient suffered no pain from passing his urine, which was voided in a good stream, and without difficulty. An instrument of the size of No. 9 catheter was passed at first twice a week, and subsequently once a week, while he remained in the house.

He was dismissed on the 19th May, when the wound had become healed, his only complaint being a much more frequent desire than natural to evacuate the bladder.

About four weeks afterwards, he returned to have an instrument introduced, and no contraction was found to have taken place. He has been almost constantly under the influence of intoxicating drink since his dismissal, by his own admission.

In the end of August, he again made his appearance, when a No. 10 catheter was introduced.

CASE II.—John Robinson, æt. 43, employed as a labourer in a quarry in the neighbourhood, sought admission to the Infirmary on the 3d July 1851, on account of retention of urine, attributed by himself to his having, during the few previous days, drank copiously of water strongly acidulated with sulphuric acid, and to his having been much exposed to damp in following his employment. He had, however, suffered, during the past eight years, from much difficulty in making water, which was at all times passed in a very small stream, occasionally in drops only, causing much pain, the necessity for emptying the bladder being very frequent, and disturbing him much during the night. He stated that he had had gonorrhœa nine years ago, the discharge continuing four weeks, and having been arrested by the internal use of medicines, and that he had suffered from retention about seven years ago, and had had instruments introduced with much difficulty; their use was continued for a short time at intervals, but having obtained relief they were discontinued, and he had not been under medical treatment until the present occasion since that time.

On his admission, although the bladder was not much distended, on account of the patient's earnest desire to have an instrument introduced and the bladder emptied, an attempt was made to pass a catheter, but, after a patient trial, the smallest instrument could not be passed farther than a distance of about three inches along the urethra, being there obstructed by a stricture, the induration surrounding which could be felt externally to extend over a space of about half an inch; and in the perineum also a mass of cartilaginous hardness of much greater extent, occupying the situation of the urethra, could be observed. The attempt to pass an instrument having been unsuccessful, an opiate enema and the use of the warm bath having been ordered, relief was in a short time procured, and under the use of mucilaginous and demulcent drinks, and occasional opiates, in a few days the patient was restored

to the condition in which he had been previous to the present attack.

About a week after admission, with the view of dilating the stricture, an attempt was made to pass an instrument, which, having failed, was repeated at intervals of three days, until about three weeks afterwards a No. 2 catheter could be introduced into the bladder, resistance to its passage being met with in two situations,—viz., about three inches from the meatus, and about the commencement of the membranous portion of the urethra, the latter of these strictures being extremely tight, and of much greater extent than the former.

The attempt to cure the patient by dilatation of his strictures having been continued during the months of August and September, it was found that no larger instrument than No. 4 could be passed; and, with the patient's consent, division of the posterior stricture was performed by external incision, and a No. 5 catheter was introduced. The hemorrhage during the operation did not exceed half an ounce, and there was none afterwards. The catheter was retained in the bladder three days. The urine continued to escape entirely by the wound during the first ten days after the operation; after that period it escaped partly by the wound and partly by the natural passage. The wound maintained a healthy appearance, and closed rapidly.

A week after the operation, a No. 7 catheter was, without the slightest difficulty, introduced into the bladder, and the following week a No. 9, which was passed once a week till his dismissal from the house on 4th November, at which time the wound was nearly closed, and the patient expressed much satisfaction with the result of his treatment.

He has returned to have a catheter used at short intervals since his dismissal.

January 23, 1852.—Considerable contraction of the anterior stricture has taken place, No. 7 being the largest instrument which can be passed, but there is not the slightest return of the one situated posteriorly, which was operated on.

ARTICLE VI.—*On Leucocythemia, or White Cell Blood.* By JOHN HUGHES BENNETT, M.D., F.R.S.E, Professor of the Institutes of Medicine and of Clinical Medicine in the University of Edinburgh.—(*Concluded.*)

CASE XXXVI.—*Commencing Leucocythemia determined during Life; Enlarged Spleen and Liver; Ascites.*

Thomas Welsh, a sailor, æt. 20, admitted into the Clinical Ward of the Royal Infirmary, September 22d, 1851. In June 1847, he first experienced a gnawing pain in the left side, and a hard swelling was distinctly felt in the splenic region.

Shortly afterwards he was attacked with jaundice, and he became sensible of a swelling also on the right side of the abdomen. He says, that, owing to medical treatment, this latter swelling disappeared, and he regained his health. Since then he has occasionally had attacks of jaundice, and the abdomen has slowly enlarged, notwithstanding the internal use of large quantities of mercury and iodine.

On admission, his body generally is emaciated; the abdomen is considerably enlarged, measuring thirty-two inches round the most prominent part, which is two inches above the umbilicus; no fluid can be detected. The hepatic dulness measures vertically at its deepest part six inches, and its lower margin can be distinctly felt below the ribs, the left lobe sweeping backwards and upwards, and apparently coming in contact with the spleen. The splenic dulness measures vertically eight and a quarter inches; the anterior margin can be distinctly felt, with a notch in its centre, terminating on a level with the upper edge of the iliac bone. Bowels are generally loose; respiration is embarrassed and thoracic; no dulness on percussion over the chest; no cough, but occasional sibillation heard on auscultation; impulse of heart feeble, otherwise normal; pulse 78, small and weak. He has not increased in stature since he was sixteen, and has the external aspect of a boy of that age; generative organs not developed; urine healthy; skin of a dingy yellowish colour. On microscopic examination of the blood, it was ascertained that the colourless and coloured corpuscles presented their normal relative number.

It is unnecessary to follow the progress of this case minutely. It will suffice to say, that the bowels every now and then became very loose; he occasionally had epistaxis, and frequently more or less tenderness over various parts of the swollen abdomen. In October, he experienced a severe attack of acute laryngitis, from which he recovered in fifteen days. During the latter part of December ascites came on, the excretion of urine diminished in amount, and it was intensely loaded with lithates. The blood had been examined from time to time; and on the 3d of January, a decided increase of the colourless corpuscles were observed. A diuretic treatment, by increasing the amount of urine, caused the ascites to diminish. But the number of colourless corpuscles gradually increased, so that, during the whole of February, considerable groups of these bodies could be seen between the rolls of coloured discs in a demonstration under the microscope.

Latterly, his general strength became much diminished; but his mother insisted on taking him home to Berwick, and he left the Infirmary, Feb. 27th, 1852.

As soon as it was determined that the colourless corpuscles of the blood had decidedly increased, I requested Dr W. Robertson to analyse the blood, which he did on the 7th of January, with the following results:—The blood coagulated firmly, but little serum exuded from the coagulum, although it stood undisturbed for forty-eight hours. Surface of coagulum flat, and thinly coated with fibrin.

Density of blood, ...	1043·5
" of serum, ...	1027·

Composition of 1000 *parts.*

Fibrin,	... ...	3·2
Serous solids,	Organic, 70·4; Inorganic, 10·3	80·7
Globules,	... ...	82·3
	Total solids, ...	166·2
	Water, ...	833·8
		1000

The above case fills up a blank in the history of leucocythemia, the change in the blood having been observed to commence and go

on increasing in a case of chronic enlargement of the spleen and liver. In many other particulars the case resembled that of Tinlay. (Case II.)

For the next case I am indebted to Dr Monro of Dundee, who has the patient at present under his care. The following is the note he gave me concerning it :—

Case XXXVII.—*Leucocythemia detected during Life; Enlargement of the Spleen.*

Mr A. R., farmer, æt. 45, of a spare habit and dark complexion, has been long a martyr to dyspepsia and its numerous concomitants, especially headaches, for which he has used a host of remedies, medicinal and dietetic, with only partial or temporary benefit. About the beginning of last January, when complaining more than usual, especially of pain and uneasiness of left side, I examined the chest, and found, along the lower margin, extending upwards to within three inches of left nipple, great dulness on percussion ; and in the abdomen on the same side, was a large tumour, of firm consistence, extending downwards as far as the umbilicus, and filling almost the whole of the upper portion of left side of abdomen, at its lower extremity especially ; it was moveable, and the fingers could be introduced beneath it for a little way. On the 19th of the same month he suffered severely from violent pain in the situation of the tumour, with great flatulent distension of the stomach. Large doses of morphia alone afforded relief, which he continued to use, more or less, for about a fortnight. During this period, also, he took mercurials, to affect the mouth slightly, the bowels being kept daily open by laxatives ; and externally the tumour was brushed with tincture of iodine. Latterly, suspecting that the tumour might be enlarged spleen, and the case one of leucocythemia, I examined the blood by the aid of the microscope, and found numerous colourless blood corpuscles, exactly resembling those described and delineated by Professor Bennett in the "Monthly Journal."

Since this period he has been using a mixture of sulphate of quinine and tincture of muriate of iron, keeping the bowels daily open by means of pills of aloine, jalapine, and extract of hyoscyamus, and a large opiate plaster to cover the whole swelling. Under this treatment he has improved considerably. He has no pain, except when he takes too much food, for he has a keen appetite ; he has gained strength, and is able to attend to his out-door duties. The pulse has been always naturally slow, and all the other functions are natural and healthy.

March 2d.—On examining the tumour this day it seems smaller ; has almost no pain on pressing it ; his health and strength are decidedly improved ; and he takes almost daily exercise in the open air, and otherwise attends to the duties of the farm, &c.

Upwards of twenty years ago, he informs me, he suffered from a severe attack of inflammation of some of the abdominal viscera, for which he was largely blooded and cupped ; but was not aware until the beginning of the present year, of any swelling in the abdominal region ; but conceives it quite possible that such a tumour may have existed without his being conscious of it.

Wm. Monro.

Dundee, 2d March 1852.

On examining the blood kindly sent me by Dr Monro, I found the colourless corpuscles almost as numerous as in Tinlay's case. (Case II). I placed the bottle, containing an ounce, which had been previously defibrinated, in the hands of Dr Robertson for analysis, to whom I am indebted for the following note :—

Analysis of Blood from Dundee.

The blood seemed to have been thoroughly defibrinated. A drop exposed to the air soon assumed the arterial hue. After remaining undisturbed for a few hours, it had formed *three* distinct strata,—the first, and lowest, amounting to *four-sevenths* of the mass, and consisting of dark fluid blood, together with the fibrin and zinc fragments, which had been used to promote its separation; the second and middle stratum, occupying *two-sevenths* of the phial, consisting of a reddish, cream-coloured, opaque fluid, containing a very large quantity of the white corpuscles; the third and highest stratum, in bulk amounting to one-seventh of the whole, and consisting of reddish, nearly transparent serum.

The specific gravity of the blood was 1044.

The proportion of fibrin 4·2 per 1000.

On agitating the middle stratum with sulphuric ether, a considerable amount of fatty matter was separated.

The *white* corpuscles varied in diameter, from about $\frac{1}{1800}$th to $\frac{1}{4000}$th of an English inch; the mean of 20 measurements was about $\frac{1}{2700}$th. On the addition of acetic acid, all were seen to be distinctly nucleated; some nuclei were single and globular; others double or triple; most were bent and irregular. The diameter of the nuclei varied between $\frac{1}{3500}$th and $\frac{1}{7000}$th of an inch.

The *red* corpuscles had an average breadth of $\frac{1}{3500}$th of an inch. They were, however, very irregular in size, some, which were carefully measured, not exceeding $\frac{1}{10000}$th of an inch in diameter.

W. ROBERTSON.

Chemical Composition of the Blood in Leucocythemia.

The blood in leucocythemia has now been analysed nine times. Six of these analyses were performed by Dr William Robertson of Edinburgh, one by Mr Drummond, one by Dr Parkes of London, and one by Dr Strecker of Giessen. The following is a tabular view of these analyses:—

Analyses of the Blood.

Case.	Sp. Gr. of Blood.	Sp. Gr. of Serum.	Fibrin.	Serous Solids.	Globules.	Total Solids.	Water.
II.	1041·5	1026·5	6·0	72·0	67·5	145·5	854·5
III.	1036·0	1023·0	2·3	67·0	49·7	119·0	881·0
XXXII.			2·43	93·20	100·75	196·47	801·32
IX.	1049·5	1029·0	5·0	95·0	80·0	180·0	820·0
VIII.			7·08	75·22	101·63	183·93	816·07
Later Analysis.			4·75	77·52	97·93	180·2	819·8
XXX.			4·46	82·35	97·39	184·2	815·8
XXXVI.	1043·5	1027·0	3·2	80·7	82·3	166.2	833·8
XXXVII.	1044·0		4·2				

From these data, Dr W. Robertson has been kind enough to contrast Lecanu's standard of the average composition of healthy blood, with the calculated mean of all the known observations made on the blood of leucocythemia, in the following table:—

		In Health.	In Leucocythemia.
Proportions in 1000 parts Blood.	Spec. Grav. of Blood, ...	1052	1043
	Spec. Grav. of Serum,.........	1029	1026·4
	Total Solids : Water, ...	As 1 : 3·762	As 1 : 4·9
	Serous Solids : Water, ...	1 : 9·675	1 : 10·33
	Serous Solids : Total Solids,	1 : 2·625	1 : 2·11
	Globules : Total Water, ...	1 : 6·220	1 : 9·81
	Globules : Total Solids,........	1 : 1·653	1 : 2·0
	Globules : Serous Solids, ...	1 : ·630	1 : ·949
	Fibrin : Water, ...	1 : 263·00	1 : 189·6
	Fibrin : Total Solids,...........	1 : 70·00	1 : 38·7
	Fibrin : Serous Solids, ...	1 : 26·66	1 : 18·35
	Fibrin : Globules, ...	1 : 42·33	1 : 19 35

From these results it would appear that the chemical constitution of the blood in cases of leucocythemia, consists in an excess of the fibrin and diminution of the corpuscles, while the serous solids undergo little if any diminution. In seven out of the nine analyses, the fibrin exceeded the normal amount. Of the two exceptional cases, in one (Case III.) there was purpura hemorrhagica, a disease characterised by Becquerel and Rodier, as being deficient in fibrin. In this instance, however, the fibrin amounted to 2·3 parts in a hundred, a quantity which may be considered high in a case of purpura. In the other case (Case XXII.), the blood was obtained, after death, from the heart and veins, instead of from the living subject, as in Dr Robertson's analyses. In the other seven analyses, the fibrin varied from 3·2 to 7·08 parts in a thousand.

In all the analyses, the blood corpuscles were under the normal standard. In Case III., affected with purpura hemorrhagica, they were so low as 49·7, and in Case VIII., the highest in the table, they only amounted to 101·63 in the thousand parts. The table indicates that no relation can be detected between the excess of fibrin and the diminution of corpuscles. In Case II. the fibrin amounted to 6, and the globules to 67·5, and in Case XX. the fibrin was 7·08, and the globules 101·63 in a thousand parts.

The clot has been analysed in two cases, in one (Case II.) by Mr Drummond, in the other (Case XXVI.) by Bessière. The results were very different.

Analyses of the Clot.

CASE II.—Water,	- - - -	745·8
Total Solids,	- - -	254·2
		1000.0
Fibrin,	- - - -	7·39
Fatty Matter,	- - -	1·43
Fixed Salts,	- - -	8·21
CASE XXVI.—Water,	- - -	857·7
Albumen,	- - -	83·7
Fibrin,	- - -	22·1
Fat and Extractive Matter,	-	2·1
Loss,	- - -	5·0
		1000·0

With regard to the iron in the blood, its amount has been determined in two cases, one by Dr Strecker (Case XXX.), the other by Mr Drummond. (Case II.) The former found in 100 parts of the ashes 3·42 of oxide of iron, the latter 2·06.

Leucocythemia viewed in relation to Inflammation.

The essential phenomenon of inflammation is exudation of the healthy liquor sanguinis, through the walls of the capillaries.[1] The circumstances which lead to that exudation, though now tolerably well understood, have been differently explained by various writers. Thus the occasional and accidental accumulation of the colourless corpuscles within some of the smaller vessels were considered by Drs Addison[2] and J. C. B. Williams as an important, and even essential, part of the process. The latter author observes:—"It seems, then, to be well established that an essential part of inflammation is the production of numerous white globules in the inflamed vessels; and that the obstruction of these vessels is mainly due to the adhesive quality of these globules."[3] Shortly after these views were published, I made the following statement:—"Without denying the occasional accumulation of these lymph corpuscles in certain vessels, I must record my conviction, that inflammation, accompanied by complete obstruction, may be frequently occasioned, independent of any such phenomena."[4] Numerous observations, again and again repeated, having fully convinced me that excess of colourless corpuscles had nothing to do with the stoppage of the blood in inflammation, I concluded an account of these with the following passage, in 1847:—"It may be concluded, then, that there is no increase in the white corpuscles in inflammation,—no crowding together of them, so as to produce obstruction of the vessel," &c.[5] Notwithstanding these observations, however, Dr Williams pertinaciously maintained this doctrine in the second edition of his work, published in 1848, observing, in allusion to the obstruction of vessels in inflammation:—"The chief cause of obstruction seems to be comprised in the two circumstances—the increased production of the white globules, and their remarkable disposition to adhere to the walls of the vessels and to one another."—P. 260.

This theory, which never reposed on accurate observation even in frogs, may be considered to have received its *coup-de-grace* by the discovery of leucocythemia in man. Here the colourless corpuscles *are* increased in number in the smallest vessels, and yet, instead of a universal inflammation, persons live in that condition

[1] See the author's treatise on Inflammation as a process of Anormal Nutrition, chap. v. Edinburgh, 1844.
[2] Medical Gazette, January 29, 1841.
[3] Principles of Medicine, 1st edit., p. 413. 1843.
[4] Edinburgh Medical and Surgical Journal. October 1843.
[5] Monthly Journal of Medical Science, p. 505. January 1847.

for months and years, without any obstruction of the vessels whatever. Next to the discovery of what is new, the progress of science is most advanced by the expulsion of the erroneous observations and imperfect theories which encumber it.

Neither can the view of Mr Wharton Jones, who considered inflammation to depend primarily upon increased spissitude of the blood, and adhesion of the coloured corpuscles to one another and to the vascular walls, be considered tenable.[1] The facts recorded in the first part of this memoir demonstrate that in one instance the fibrin was augmented to 7·08 parts in a thousand (Case VIII.), in another it was increased to 6·0 in a thousand. (Case II.) On examining the blood immediately after its abstraction from the living body in several cases of leucocythemia, the coloured corpuscles were seen to aggregate themselves together in the manner so accurately described by Mr Wharton Jones. The same facts were observable in Cases IX., XXVIII., and in other instances; but in none of them were the smaller vessels and capillaries obstructed, or the phenomena peculiar to inflammation induced.

On the other hand, every known fact convinces me, and the progress of science only adds strength to my convictions, that we must ascribe the ultimate cause of inflammation to a derangement of those forces which regulate the nutritive powers of the economy, and that the only correct definition of inflammation itself is—an exudation of the normal liquor sanguinis. It is in vain that physiologists seek in the alterations of the vessels on the one hand, or in morbid changes of the blood on the other, for the primary cause of this important condition. Facts prove that both are more or less affected, and also show that neither the one change nor the other, nor the two combined, constitute inflammation. The vital properties of the tissues (understanding by these the unknown conditions necessary for carrying on the nutritive processes) are in all such cases deranged, and such alteration is the cause of the changes which have been referred to, and not the effect.

Leucocythemia viewed in relation to Purulent Infection.

That morbid condition, so much dreaded by surgeons and obstetricians, in which typhoid fever comes on after severe accidents or parturition, accompanied with purulent infiltration, or multiple abscesses, in one or more organs, has received different explanations. The various observations and experiments performed with a view of elucidating this subject in modern times have led to the four following theories:—

1. That this condition is owing to an admixture of the blood with pus (pyohemia of Piorry), and that the pus corpuscles being larger

[1] Guy's Hospital Reports, Second Series 1850.

than the coloured ones of blood, are arrested in the minute capillaries, and give rise to secondary abscesses.

2. That it is owing to the presence of any irritating body, which cannot be eliminated from the economy, producing capillary phlebitis.

3. That it is dependent on a property possessed by pus of coagulating the blood.

4. That it is caused by the presence of a peculiar poison which contaminates the system.

All these views have been maintained with much ingenuity, and they are all supported by experimental and clinical researches. A knowledge of the circumstances previously detailed concerning leucocythemia will enable us to criticise these doctrines from a new point of view.

With regard to the first theory, it must, I think, be granted by all those who have examined the blood in leucocythemia, or will study the figures in the first part of this memoir, that no difference whatever can be detected between the colourless cells of the blood and those of pus. Their general appearance, size, structure, and behaviour, on the addition of re-agents, are identical,—indeed so much so, that in the first case I observed in 1845, I could not resist the conclusion that the blood was crowded with pus cells. It follows, that all explanations of purulent infection founded upon the mechanical impaction of these bodies in the minute capillaries must be erroneous. Some of these colourless corpuscles have been observed much larger than ordinary pus corpuscles. (Case XI.) In one instance—a man still living—many of them were twice as large, and although this may in some measure be owing to endosmosis of serum, there can be little doubt that they must have exceeded the usual size of pus cells. (Case XXXVII.) In Case II., also, it was observed that several of the colourless cells were larger than the average, and yet the circulation went on, and every drop of the patient's blood contained hundreds of these bodies. The first theory, then, is no longer tenable.

Neither does there seem to be anything peculiar in the substance of good and laudable pus, which necessarily leads it to poison the blood; for it is a matter of common observation, that large abscesses are absorbed and eliminated without occasioning so-called purulent infection. In all such cases, the pus corpuscles must, in the first instance, be disintegrated and reduced to a fluid condition; still the matter or substance of which they were composed passes into the blood. Hence, while leucocythemia proves that corpuscles, identical in form, size, structure, and chemical composition with those of pus, may float in the blood and circulate innocuously, the well-known fact of the absorption of abscesses demonstrates, that pus, when healthy, is not associated with any poisonous properties. If, then, the fever and other marked symptoms are owing to pus, it must be pus possessing properties wholly different from that which is generally called good or laudable.

The second explanation was advanced by Cruveilhier, who, on injecting mercury, ink, and other substances into the blood of a living animal, found that the multiple abscesses were formed wherever these accumulated. Hence impaction of some substances, and consequent local inflammations, *may* lead to abscesses ; but that such is not the necessary result of admixture of pus with the blood, is proved not only by the previous observations, but by numerous experiments of Lebert[1] and Sédillot,[2] in which the animals recovered.

The third doctrine was advanced by Mr Henry Lee,[3] and resulted from observing that when pus was mingled with recently-drawn blood, it coagulated more rapidly and more firmly than under ordinary circumstances. This observation he connected with the well-known fact, that phlebitis was often associated with coagula causing obstruction of the veins. Now it is worthy of remark, that in decided cases of leucocythemia the blood is more highly coagulable when drawn from the arm, and after death it often presents firm coagula filling the vessels, as in Case I. The same occurred in Case II. ; and yet, during the life of the patient, the blood, loaded with the colourless corpuscles, rolled through the vessels without impediment or the formation of coagula. It does not follow, then, that because dead pus is mingled with recently-drawn blood about to coagulate, that therefore it should induce coagulation of living blood in the vessels of an animal. Indeed, numerous experiments by Lebert and Sédillot show that such does not take place ; for, although in some cases death followed, in others the animals lived, and the pus corpuscles were dissolved. Hence, although the fact to a certain extent must be admitted, that when pus is mingled with blood the coagulum formed is more firm, it by no means follows that it produces coagulation of *living blood*, and is the cause of phlebitis or purulent infection.

The fourth theory seems to have been maintained by A. Boyer[4] and Bonnet,[5] who believed good pus to be innocuous, and the bad effects occasionally produced to depend on its becoming putrid, or being otherwise altered. This view was also more or less supported by Darcet[6] and Berard,[7] who, in order to explain the undoubted effects of putrid substances when injected into the veins, separated pyohemia from purulent infection. But as pus corpuscles do not alone cause the symptoms, it is certainly more probable that, in all cases, there must be a toxic effect associated with pus when it proves mortal. Dr Millington[8] has shown, in repeating Mr Lee's experi-

[1] Physiologie Pathologique, tom. i., p. 313.
[2] De L'Infection Purulente, p. 73, *et seq.*
[3] On the Origin of Inflammation of the Veins. London, 1850.
[4] Gazette Méd. de Paris, p. 193. 1834.
[5] Ibid., p. 593. 1837. Both cited by Sédillot, Op. cit., p. 55.
[6] Thése Inaugurale. Paris, 1842.
[7] Dictionnaire de Méd., tom. 26. 1842.
[8] Monthly Journal. November 1851. P. 486.

ments, that putrid fluids prevent coagulation of the blood, and that the coagulum caused by the addition of pus is more perfect the fresher the purulent matter is. This fact is opposed to the idea, that multiple abscesses are induced by the coagulation, but corresponds with what is observed after death in cases of purulent infection. When, therefore, we consider the typhoid nature of the symptoms so similar to that of certain animal poisons; the multiple abscesses so analogous to what occurs in glanders, plague, syphilis, variola, &c.; and the undoubted fact, that the blood may be loaded with corpuscles in every respect identical with pus cells, without causing these symptoms, the irresistible conclusion is, that these effects are not owing to pyohemia, but to an animal poison.

This view has been opposed on the ground that fresh pus, to all appearance healthy and without odour, has yet caused the death of animals. But what sensible property distinguishes the pus of the vaccine from the small-pox pustule, and either of these from healthy pus? And yet how different their effects when introduced into the blood! The subject of animal poisons is certainly obscure; but we advance our knowledge by attributing purulent infection to this cause, rather than in considering it to be the mere mixture of pus with the blood, or a so-called pyohemia.

Leucocythemia viewed in relation to Phlebitis.

In none of the cases of leucocythemia could phlebitis, though carefully looked for, be anywhere discovered. Although, in some instances, the clot was firmly coagulated, its colourless portion of a dull colour, very friable, and containing a multitude of corpuscles identical with those found in pus, nowhere was it adherent to the vessels. This was well observed in Case I., in which the veins everywhere presented their normal transparency and thickness, notwithstanding the alteration in the blood. In phlebitis the effects are different. The vein is more or less thickened, the coagulum inside adherent, and obstruction of the caliber of the tube occasioned. From the numerous cases of phlebitis observed, especially when it originates in the uterine veins, the same general symptoms are produced as in the so-called cases of purulent infection. This indeed has been considered by many as the source of the pus corpuscles which mingle with the blood. But it is by no means shown, that, under such circumstances, the pus corpuscles actually circulate in the blood, much less that, if they did, the fatal result can be attributed to them. On the other hand, from the epidemic nature of the disease in puerperal women, and from its contagious character, a point which seems to be well established among practical obstetricians, it is more probable that here also a toxic effect is occasioned, which operates on the blood altogether independent of the pus corpuscles.

There can be no doubt that when, owing to phlebitis, a coagulum

forms in the vessel, and obstruction of the blood occurs, that the clot softens, and is converted into pus. I have frequently seen such softened clots in veins, and on the internal surface of the cardiac cavities, to be composed of colourless cells, presenting all the characters of pus corpuscles, floating in a slightly molecular fluid. In most cases these corpuscles are prevented from entering the circulation, on account of firm fibrous coagula existing between the diffluent portion of the clot and the moving blood. But it is maintained, that occasionally the whole suppurates, and, on joining the circulation, causes the symptoms of purulent infection. If so, I argue the effect must depend upon either the toxic power of such pus, or upon fragments of the coagulum being carried into the circulation, and acting mechanically, as the mercury did in the experiments of Cruveilhier. This point, however, in the history of phlebitis, requires further investigation, as well as the separation of such mechanical effects, should they occur, from the poisonous influence of altered or putrid pus.

From all that is known of the morbid anatomy of phlebitis, of the symptoms it occasions, and of the absence of these in cases of leucocythemia, it follows, not only that these symptoms are not occasioned by the circulation of colourless corpuscles in the blood, but that the conclusions formerly arrived at, as to the origin and physiological importance of these bodies, are correct.

On the relation between Morbid Conditions of the Lymphatic Glandular System and of the Blood.

It is a matter of common observation, that the lymphatic glands and vessels swell in the neighbourhood of an irritating wound, and that the former are especially liable to become the seats of cancerous and tubercular matter, apparently the result of absorption from primary sores or lesions. The nature of this enlargement in lymphatic glands has not hitherto been very clearly understood. Generally speaking, it is attributed to secondary inflammation, which, if not subdued, advances towards suppuration, and in its turn becomes the source of similar lesions in the next series of lymphatic glands.

On examining glands which become enlarged from the result of irritation from a neighbouring ulcer, we find them to be soft, and to yield readily on section, a dirty turbid fluid. If we examine this fluid under a magnifying power of 250 diameters linear, we find it to be crowded with naked nuclei and the cell elements of the gland, some of which last are frequently enlarged, and contain a considerable number of nuclei. It would appear that, under these circumstances, the nuclear and cell elements not only increase in number, but that some of the latter assume a power of development which they never present in a state of health. For instance, instead of there being one nucleus, it multiplies fissiparously, so that there are two, four, or even a greater number.

This condition is remarkably well observed in the enlarged mesenteric glands which accompany typhoid ulcerations in the intestines. They are then greatly distended, varying in size from a hazel nut to that of a hen's egg. They are externally vascular, of a bright red or purple colour, are soft and pulpy to the feel, and, on section, present a slightly granular surface, of grayish or fawn-yellow colour, and frequently exhibit commencing softening. They are friable, and yield a grayish or dirty purulent-looking fluid, on examining which with a magnifying power of 250 diameters, it will be found to contain numerous cells, generally spherical, varying in diameter from the 1-150th to the 1-35th of a millimetre. In some cases the nucleus occupies three-fourths of the cell, and is composed of an aggregation of numerous nucleoli, of about the 1-200th of a millimetre in diameter.[1] At other times, from one to four of these nucleoli may be seen scattered within the cell, either with or without a round or oval transparent nucleolated nucleus. On the addition of acetic acid, the cell wall is rendered very transparent, whilst the nucleoli are unaffected. Many of them are free, and at first look like altered blood corpuscles, from which they are at once distinguished by the action of acetic acid.

This power of increased development may be observed not only in the mesenteric, but in the spleen and other lymphatic glands. In a case of large epithelial ulcer of the leg, I examined the glands after death with great care, and found them much enlarged, dependent apparently on the excess of naked nuclei and increased number of cells they contained. I have observed the same alteration in the axillary and cervical glands. Its occurrence in the spleen has been previously noticed. This enlargement and softening of glandular organs is strictly analogous to what occurs in articular cartilages, from the increased development of cells, and a multiplication of nuclei within them, as observed and accurately figured by Dr Redfern.[2]

In certain morbid conditions, I have seen the ordinary epithelial or epidermic cells of an organ present the same tendency to multiplication. Thus, in the lung in certain cases of typhoid pneumonia, I have seen the epithelial cells exhibit the same multiplication, with increase of nuclei.

In the epidermic cancroid disease observed in the lips, and in the scrotum of chimney sweeps, the epidermic scales increase far beyond their normal size; the cells and nuclei also enlarge, and the latter often exhibit a disposition to multiply fissiparously.[3]

In certain tumours of the mammæ, the ducts also may be observed to become distended with epithelial cells, constituting an increased

[1] See the Author's Treatise on Cancerous and Cancroid Growths. Figs. 188, 189, and 190.

[2] On Anormal Nutrition in Articular Cartilages. Edinburgh, 1851.

[3] On Cancerous and Cancroid Growths. Fig. 114.

growth of cell elements, which obstruct the tubes.[1] A similar fact may be exemplified in tumours of the parotid, and in certain cases of cerebral meningitis affecting the ventricles, when the epithelium covering the choroid plexus is not only greatly increased in thickness, but many of the individual cells exhibit an increased number of nuclei, altogether distinct from fatty degeneration.

From all these facts, therefore, it is evident that, under certain conditions, the growth of cell elements in an organ, or on the surface of membranes, may be increased, and constitute diseases, the symptoms of which have been long known to medical men, although we are only commencing to understand their nature. In the lymphatic glands, as we have previously seen, these cells are frequently formed, and many of them enter the blood, and are visible there, constituting leucocythemia. An extensive inquiry is thus thrown open to the histological pathologist, having reference to the questions, how far do structural alterations in the lymphatic glands affect the blood? and how far do alterations of the blood re-operate upon the glands?

A peculiar alteration is occasionally observable in the spleen, which, it appears to me, can only be explained by the assistance of the facts previously detailed. I allude to the occurrence of an opaque discoloration and destruction of the glandular tissue, of greater or less extent, closely resembling a so-called deposit.

In many cases of leucocythemia, patches of this whitish matter were seen in the spleen; and in Case XI. the cut surface showed that the entire spleen presented this alteration in various stages. A series of preparations in the University Museum exhibits this lesion under a variety of aspects, as I observed it during an epidemic of typhoid fever which occurred in this city during 1846–7. Occasionally the morbid mass softens round its circumference, and separates or sloughs out, when fatal peritonitis is the result.

On examining this altered texture in the spleen, with a power of 250 diameters linear, it is found to consist, of — 1st, Numerous molecules and granules; 2d, Free nuclei; 3d, Compound granular cells of various sizes; 4th, Fragments of the fibrous tissue and fusiform corpuscles of the organ.[2] The granular cells were frequently ruptured, more or less broken down, and appeared to me to be the remains of the large glandular cells formerly spoken of, which had undergone a disintegrating process. It is very possible that, under certain circumstances, the glandular cells enlarging in the manner previously described, cannot escape from the organ, and by aggregating together do not discharge their nuclei. They then undergo a disintegrating process, which constitutes the morbid alteration now alluded to.

A somewhat similar lesion, probably dependent on the same series of changes, is occasionally observable in the kidney and mesenteric

[1] Cancerous and Cancroid Growths. Figs. 92, 93, and 94.
[2] Ibid. Figs. 186 and 187.

glands. The alteration known as waxy liver is apparently allied to an analogous transformation. Here the tissue presents the appearance of yellow bees' wax; and the cells of the altered structure, instead of being filled with oil globules, as in the fatty liver, are empty, colourless, compressed together, and more or less collapsed and broken down. Hence there is not only a lesion dependent on excess of cell element, and multiplication of included nuclei, but its history may be traced by alterations in texture resulting from the disintegration of such cells.

The history of all these lesions has yet to be written. But the time, I trust, is not now far distant when a systematic pathology may be rendered possible, on the basis of chemico-histological research. Happily there are many men in this and foreign countries who are laboriously toiling to unravel the mysteries of altered structure, in connection with the clinical study of disease. To their investigations we must look as the only means of so advancing pathology, that it may be received by the profession as the true basis of a rational system of therapeutics.

In conclusion, I would direct the attention of my medical brethren to an extended study and investigation of the blood clinically. The means of doing this, with the assistance of the microscope, are now most easily attainable,[1] and the following points deserve attention :—

1. In some cases of typhoid fever, where there was every reason to expect disease of the intestinal glands, the colourless corpuscles have been stated to be increased in number. The importance of this observation will be recognised, when it is remembered, that, according to Brucke, these structures constitute the first series of the lymphatic glands. Further observations on an extended scale, however, are required, especially in France and Germany, where enteric fevers are so common.

2. An examination of the blood in cases of bronchocele seems advisable, especially in places where it is endemic.

3. In all cases where the blood glands are extensively affected, whether from hypertrophy, scrofula, or cancer, it is possible that the blood may be found more or less altered in the relation of the colourless to the coloured corpuscles. If so, further research may explain the contradictory statements which have been advanced, having reference to the actual detection of cancer cells in the blood.

4. In all cases of abdominal tumours, as a general rule, it may be well to examine the blood microscopically.

5. This should also be done in cases of purulent infection, puerperal fever, small-pox, glanders, syphilis, and all other disorders where the blood is affected on the one hand, and the lymphatic glandular system on the other.

[1] See the Author's Lectures on Clinical Medicine. Part V. Edinburgh: Sutherland and Knox. 1851.

6. A chemical analysis of the blood in these cases is desirable, as it is only by a multiplication of such observations that fair average results can be arrived at.

7. There are some cases of anemia which kill, apparently without obvious cause. In these it may be well to examine the lymphatic glands. In a boy who so died in Heriot's Hospital, under the care of Drs Christison and Andrew Wood, the only lesion discovered after death was induration and cell disintegration of the mesenteric glands.

All this constitutes a series of researches, which can only be carried out by interesting different individuals, especially those engaged in pathological investigation in large hospitals. Such, however, may be considered as absolutely necessary information to be obtained, before the laws of nutrition and the diseases connected with their derangement can be fully understood.

Part Second.

REVIEWS.

Notes on Lunatic Asylums in Germany and other parts of Europe. By W. F. Cumming, M.D., late of the Bengal Medical Establishment. Churchill, London. 1852. Pp. 82. 8vo.

This is one of those agreeable little books, which patient, no less than physician, whatever his rank, may read with facility, and digest with profit, and, if he be British born, with pleasure also, because he will rise from the perusal better pleased with his own native land and its institutions. As great a pursuer of foreign travel, as his notorious clansman of savage beasts, Dr Cumming, aware that a man's humours are not given him for his own gratification only, but keeping his Notes by the wayside, now and then entertains the *adstrictos glebæ* at home, in an easy unostentatious way, with his erratic experiences. He was thus one of the first, if not the first, to point out the advantages possessed by Egypt, as a residence for consumptives, over Malta and Madeira;[1] and often have we availed ourselves in practice of his discovery. He now apprizes us, that, if in need of a lunatic asylum, the most

[1] Notes of a Wanderer in search of Health, through Italy, Egypt, Greece, Turkey, up the Danube, and down the Rhine. London, 1839.

maniacal of travellers had better stay at home, for nothing so good will be found abroad in that line. He goes to Hamburg, he repairs to Berlin, to Sonnenstein near Dresden, to Leubus in Silesia, to Siegburg near Bonn, to Prague and Halle, to Gheel in Belgium, all of them places of note in the history of lunacy. And, though he fails to acquire the information he was in search of,—viz., whether "the metaphysical character of the German people manifested itself in peculiar forms of derangement, or peculiar methods of cure," he arrives at the not less important information, that "England," meaning, we presume, Great Britain—for in this respect most assuredly the northern end of it is no unsuccessful rival of the south —"can boast of institutions for the insane, both public and private, inferior to none, and perhaps superior to any, in Europe."

In one asylum he finds "no fields to cultivate, no gardens to tend, no workshops to labour in, nothing but a yard for the game of bowls, and a dimly-lighted cellar for the monotonous occupation of sawing wood." In another he beholds patients "walking about in strait jackets, others strapped to fixed chairs, and one bound down in bed." In Berlin he witnesses a most unmetaphysical means of coercion in a forcing pump of four-man power, the jet of which is driven against the bare spine of all and sundry by a complacent physician, who enthusiastically admits that he cannot himself endure it for thirty seconds. At Siegburg, he "saw patients of both sexes under restraint, and notably two in a sort of sentry-box, with only their heads and necks exposed." And on inquiry into the history of this very perfect invention, he was startled to learn they were "English chairs," imported from England—probably half a century ago, and *via* China. At Gheel ankle chains are used by way of "drag" on fugitive propensities; and if we do not read our author incorrectly, patients there are still sometimes, as they invariably were some ten or twelve centuries ago, "chained in a chamber adjoining the church" of St Dympna, to hear priests and relatives uttering to her saintship intercessions, which are said by the parish rector to possess singular therapeutic energy. At Hamburg, worst of all, our traveller found inquisitive people not in favour; and not without reason; for, though he saw little or nothing, he learned afterwards that about 150 of the patients "were chained by the legs in dark and damp dungeons, where the noise and uproar of Pandemonium prevailed." And the excuse given by an ashamed Hamburger for this backward state of things seems to amount to the proposition, that the great merchant city, though rich enough to provide all possible luxuries for the sane, is too poor to afford comforts for the lunatic. Prague possesses the only lunatic hospital he saw which approaches in organisation and management to the more benevolent institutions of Britain.

On the whole, our author leaves us with a strong impression, that, for our own individual share, we should travel a very short way indeed for an asylum after his heart; that, with all possible

respect for the Gheel drag, the English chairs of Siegburg, the Pandemonium of Hamburg, but especially, and above all, for the Berlin fire-engine, we would rather seek shelter in our own suburban Morningside, content with its magnificent scenery, its cheerful dormitories and corridors, its busy workshops, its pleasant gardens and open fields, its billiard-room, bowling-green, and curling-pond, its balls, concerts, and picnics among the hills, and—still unknown in Germany—its nice, little, empty, padded parlour, when we might feel disposed for a game at romps without any reason.

But it must not be supposed that Dr Cumming travels without finding anything at all undone at home and unworthy of adoption. In Britain we have too generally been content with providing food and lodging and kind usage for the once persecuted idiot. Dr Cumming shows us that they are also educated at Berlin and at Paris. Why not in this country too?

"It is surely a great matter," says he, "to teach the idiot to sit on a chair instead of rolling in the dust, to feed, dress, undress, and wash himself, and to be invested with at least the outward semblances of humanity. Without teaching, an idiot can do nothing for himself. He possesses no natural sentiments of shame, and has as little sense of cleanliness as a brute. But, by tuition, not only may these sentiments be aroused, but far greater things may be achieved. Thus, M. Vallée (at Paris) has taught his pupils, in addition to regular, orderly, and cleanly habits, to read and write, to calculate and commit to memory, to draw, to play on various musical instruments, and, in short, to display talents frequently approaching to those of normally constituted children."

"At Berlin," says he in another place, "Herr Saegert read to me a letter which another boy had just finished to his parents. The penmanship was clear and good, and the contents gave no indication of having been written by one who, four years ago, had been an absolute idiot. He gave an account of his occupations, his hours of play and study, described a visit he had made to the Zoological Gardens, and ended by expressing a hope of soon seeing his parents. This boy had been a cretin, and been sent to Berlin by Dr Guggenbühl. On arrival he showed no symptoms of intelligence, and was affected moreover with a large goitre. But so efficacious had been the system of physical and moral training, that in the period of four years his mind had been raised to the degree of intelligence I have just described; and the goitre had entirely disappeared. The treatment consisted mainly in general hygienic measures, in allowing generous diet, in the gradually increased application of mental and muscular training, and in frictions of iodine to the goitre."

We are aware that a similar system has been recently made the basis of a new institution in this country; and that there exists at Highgate, near London, a "New Idiot School." The designation is unhappy, though it possesses the merit of being diagnostic. In it are trained no less than 75 scholars. We hope the success of the benevolent founders may not fall behind that of M. Vallée and Herr Saegert, and that other cities will be speedily induced by it to follow their example.

We cannot take leave of the author's Notes, without advising the reader to make personal acquaintance with them. We must abandon the idea of presenting a readable abstract of them; for Dr Cumming is one of those medical travellers who, in printing his Notes, drops everything superfluous.

The Principles and Practice of Surgery, Illustrated by Numerous Engravings on Wood. By WILLIAM PIRRIE, F.R.S.E., Regius Professor of Surgery in the Marischal College and University of Aberdeen, &c. &c. London: Churchill. 1852.

WE are told in the Preface that this work contains the substance of the author's lectures, and has been written chiefly for the benefit of his pupils. If it had appeared five-and-twenty or thirty years ago, when the reading of surgical students was confined to "Cooper's Dictionary," "The First Lines," or Benjamin Bell's "System," the duty of reviewers would have required a strict inquiry into the principles placed in competition with those of the authorities just mentioned. But now, when almost every lecturer on surgery has composed something for the instruction of his pupils; and compendiums, whether in the modest guise of "Manuals," or decorated with more imposing titles, have issued in rapid succession from the press, any attempt to analyse such a work would be tantamount to the criticism of modern surgical literature.

Dr Pirrie seems to us to have executed his task with diligence, fairness, and success. He has collected a large amount of information, arranged it in a convenient form, and expressed it in distinct language. Through the assistance of an active London publisher, he has produced a very handsome book, with all the advantages of good paper and typography, and ornamented with many woodcuts, some of which are from the blocks belonging to a work remarkable for its excellence in this department. On the whole, we think Dr Pirrie's book creditable to the school with which he is connected, and likely to be useful, not only there, but wherever a careful digest of surgical knowledge is required.

Lateral Curvature of the Spine, its Causes, Nature, and Treatment. By R. W. TAMPLIN, F.R.C.S.E., &c. &c. London: Churchill. 1852.

CURVATURE of the spine affords a fruitful field for surgical writing, and all that has been published, instead of exhausting the supply of treatises upon the subject, seems rather to have increased the tendency to their production. Before proceeding to consider the merits of the one which has last appeared, and of which the title is prefixed, it may be well to inquire what points in regard to the pathology and treatment of spinal curvature have been determined to the satisfaction of the profession, and what still remain open for discussion.

It is admitted that the alterations of form in question depend either upon disease of the bones, attended by loss of substance, or

upon a yielding state of the osseous system, which renders the spinal column unable to support its superincumbent pressure, and resist the tendency to lateral inflexion.

It is admitted that curvatures of the first kind, which are easily recognised by their acute form and direction backwards, essentially require for their treatment, with any prospect of success, rest in the horizontal posture, and counter-irritation over the affected part of the spine, if pain or other symptoms denote the existence of inflammatory action in the tissues concerned.

It is admitted that, in the event of recovery from this disease, whether with or without suppuration, the vertebræ engaged in it must be anchylosed, so as to render any subsequent alteration of the curvature altogether impossible.

It is admitted that the second or "lateral" sort of spinal curvature, which takes place chiefly in young females before the period of puberty, depends upon a yielding state of the bones, rendering those of the spine and thorax unable to support the weight of the head and arms in the erect posture, especially if the trunk is habitually held awry in the pursuit of some sedentary occupation, or through weakness of the muscles which should maintain a straight position.

It is admitted that this sort of curvature may be prevented, by abstaining from the constrained postures of sedentary occupations, by keeping the muscles of the trunk free from the restraint of rigid articles of dress, and by duly exercising the whole body.

It is admitted that, in its early stage, before the bones have become altered in form, this curvature may be effectually checked and remedied by making the patient abstain entirely from sitting or standing *still*, and pass most of her time in the horizontal posture, with short intervals of active exercise.

It is also admitted that after the complete consolidation of maturity, the ribs and vertebræ cannot be restored to their natural form, or altered so as to remedy the curvature which has been permitted to take place.

All these important points being completely established to the conviction of every reasonable mind, the only subject that remains for question is the practicability of remedying the curvature after the bones have become altered in form, but before the consolidation of maturity. Indeed, the field of discussion thus limited, may be drawn within still narrower limits, since many of the means proposed for the purpose are manifestly either simply useless or also injurious. Thus the exercises which are so useful in the way of prevention, must plainly increase the evil when it is actually in progress; and neither roaming in the fields, nor carrying weights upon the head, can possibly make a crooked spine straight, although, as we could testify from many painful instances falling within our own observation, such thoughtless treatment may greatly aggravate the patient's distressing condition. Rest in the horizontal position, also, while nearly infallible for the remedy of those faulty actions of the

muscles which lead to deformity of the osseous system, and for preventing further mischief in the latter respect, cannot possibly restore the bones, when once altered in shape, to their normal state. Encasing the trunk in rigid stays, which by compressing and weakening the muscles so strongly predisposes to the disease, seems altogether opposed to improvement. And it is hardly necessary to add, that if the original fault of the muscles be weakness, or defective power of contraction, no benefit can accrue from cutting them across by subcutaneous incision, as has strangely enough been proposed.

From this inquiry into the present state of opinion and practice relative to curvature of the spine, it appears that the only remaining room for question is the practicability of remedying the lateral kind, by some means different from those which have been mentioned; and we may now proceed to consider how far the author who has last entered the field deserves credit for throwing light upon this part of the subject. But, before noticing the substance of Mr Tamplin's book, we cannot refrain from remarking, that if he really believed the contents were of any practical value, they should have been presented in some more accessible form. They are distributed over forty-one royal octavo pages, in a type so large and sparingly appropriated, that ten lines such as the reader now has before him would afford ample accommodation for a whole page.

We do not find that this gentleman, who is surgeon of the London Orthopedic Hospital, in any respect impugns or questions the generally-received opinions; and, in fact, we cannot discover any object to account for the production of his treatise, except the desire to let it be known that he is able to remedy deformities of the lateral kind by means of certain mechanical apparatus. As nothing could give us more pleasure than the persuasion that this belief was well-founded, we regret to say that the means proposed seem quite inadequate for the purpose, and, in fact, present no material difference from those most noxious of human contrivances, "steel stays." Essentially the machine consists of an iron hoop, surrounding and resting upon the pelvis, with a branch ascending on each side, and terminating in an arched support fitted to the axilla, but is variously complicated according to the degree of the deformity. Now it is quite obvious that as the object in view is straightening of a crooked spine and distorted ribs by mechanical force, the power required, whether applied in the way of extension or compression, cannot be obtained unless a point of resistance be afforded at each extremity of the apparatus. But, although the pelvis may serve for one of these, the axilla cannot possibly do so for the other, since there is no limit to the movement of the shoulder in an upward direction, except that of the muscles (*trapezius*, *latissimus dorsi*, *pectoralis major*, *serratus magnus*, *etc.*,) which connect the ribs and spine to the scapula, and consequently by their contraction must tend to increase the curvature. We, therefore, do not hesitate to affirm,

that no benefit can be derived from this apparatus, even though worn both day and night, as Mr Tamplin advises.

It is not long since we had the painful duty of expressing a no less decided judgment against another method of remedying curvature of the spine, proposed by a lady of Liverpool, through the same London medical publisher whose name appears on the title-page of the work at present under consideration. A peculiar manipulation of her own fair fingers was alleged to have been very successful in restoring straightness to distorted trunks; and although the recommendation of this treatment was said to be founded upon a large experience, we have no doubt that Mr Tamplin fully concurred with us in the scepticism we freely confessed as to the efficacy of any such procedure for accomplishing the object proposed. Our condemnation of "steel stays," under whatever form or title they may venture to show themselves, will, we hope, now afford some compensation for the want of gallantry to which we were then constrained by a stern sense of the duty imposed upon us in our public vocation.

An Apology for the Microscope. An Introductory Lecture. By ROBERT D. LYONS, M.B., &c. Dublin: Fannin & Co.

Pathological Anatomy considered in its Relation to Medical Science, &c. By THOMAS S. HOLLAND, M.D., &c. Cork. 1852. Pp. 31.

THESE introductory lectures carry our mind back exactly eleven years,—that is, to the period when the first course on histology was given in the Edinburgh school. That so long a time should have elapsed before similar lectures were given in Dublin, is perhaps a matter of surprise, but need not be strictly inquired into. It is satisfactory to know, that Dr Lyons has undertaken to teach this subject, although we do not see any necessity for making apologies. We much prefer the course taken by Dr Holland at Cork, who, having studied the matter systematically in Edinburgh, strongly shows the necessity, in the present state of science, for cultivating it in every medical school. We trust that both teachers will ever point out that the microscope is only a means to an end, and will avoid the unscientific terms of microscopic anatomy, microscopic researches, &c. &c. New and successful modes of inquiry lead to revolution in ideas; and, now that the wave of improvement coming from Germany has rolled over Scotland and reached Ireland, we have some hopes of its extending to the far west of America. We say, then, to our young lecturers, do not be easily discouraged,—be earnest in the pursuit of truth, and your efforts will be ultimately crowned with success.

Part Third.

CLINICAL REPORTS, LECTURES, ETC.

CLINICAL MEDICINE.—PROFESSOR BENNETT.

REPORT OF THE CASES OF FEVER TREATED IN THE CLINICAL WARDS OF THE ROYAL INFIRMARY DURING THE WINTER SESSION 1851-2.

Condensed from Clinical Lectures.

A state of fever may be said to exist when we find the pulse accelerated, the skin hot, the tongue furred, unusual thirst, and headach. These symptoms are commonly preceded by a period of indisposition varying in extent and severity, the febrile attack being marked by a rigor or sensation of cold. This rigor, though not invariably well characterised, is the symptom from which, when present, we date the commencement of the fever.

Although fever may in one sense always be said to exist when the above group of symptoms is present, such fever may be idiopathic and essential, or symptomatic of some local lesion. It is to the former condition that the term fever is universally applied. Some pathologists, indeed, have endeavoured to show that there is no such thing as idiopathic or essential fever, although they have differed among themselves as to the lesion of which it is symptomatic. Intermittent fever has been supposed to be symptomatic of diseased spleen, and remittent fever of intestinal derangement. With regard to continued fever, some have spoken of cerebral, others of intestinal or abdominal typhus. Another class have supposed, from the occasional appearance of an eruption on the skin, that it is allied to the exanthemata. If, however, you carefully watch the Edinburgh continued fever, you will easily satisfy yourselves that it frequently occurs independent of any of these lesions. Did we indeed adopt these views, we might, as Dr Christison has pointed out, with more plausibility, maintain the existence of a pulmonary typhus, as we observe the lungs to be much more commonly affected in this city, than any other organ in the body during fever. I agree, therefore, with those who consider continued fever as an essential disease, dependent on some unknown constitution of the blood, and occasionally accompanied or followed by various local lesions of the cranial, thoracic, or abdominal viscera, and with various eruptions of the skin.

Although this may be considered as the correct general view of continued fevers, it cannot be denied that it assumes various forms, which have been described in various ways by authors in this and foreign countries. Considerable confusion has consequently arisen, as to whether fevers observed in different places, and at different times, were identical or dissimilar in their nature; or whether the varieties they presented were only attributable to the concomitant lesions which might be present. Any one who studies fever first in this city, and afterwards in Paris, will soon convince himself that there are at least two predominant kinds of fever;—the one called by us typhus, the other called by the French typhoid,—that is, resembling typhus. Again, those who have studied fever in Edinburgh for the last twelve years consecutively, are aware that every now and then a form of the disease is prevalent, which runs a short course, but has a tendency to relapse at pretty regular periods. Lastly, there is in fever, as in most other diseases, a kind which is very slight, and soon ceases,—a so-called febricula.

Every practical physician is acquainted with these forms of fever; but whether they constitute varieties of the disease, which can be at all times separated, which have a distinct and invariable course, the one not being protective of the other, and so on, are points that are by no means determined.

A recent author on this subject—Dr Jenner, in a very elaborate series of papers inserted in the "Monthly Journal" during 1849-50, has endeavoured to show that febricula, relapsing fever, typhoid and typhus fevers, are four distinct diseases. He considers them, to use his own language, "as distinct from each other as are measles, scarlet fever, and small-pox, the poison of the one being, by no combination of circumstances, capable of producing, inducing, or exciting the others." The correctness or incorrectness of this doctrine we have had an opportunity of testing this session; but that you may clearly be enabled to do so, I shall, in the first place, quote the characters which, according to Dr Jenner, serve to distinguish these four kinds of fever.

"*Febricula.*—A disease attended by chilliness, alternating with sense of heat, headache, white tongue, confined bowels, high coloured scanty urine, hot and dry skin, and frequent pulse, terminating in from two to seven days, and having for its cause excess, exposure, over-fatigue, &c.,—*i.e.*, the cause of febricula is not specific.

"*Relapsing Fever.*—A disease arising from a specific cause, attended by rigors and chilliness, headach, vomiting, white tongue, epigastric tenderness, confined bowels, enlarged liver and spleen, high coloured urine, frequent pulse, hot skin, and occasionally by jaundice, and terminating in apparent convalescence in from five to eight days; in a week a relapse,—*i.e.*, a repetition of the symptom present during the primary attack. "After death, spleen and liver are found considerably enlarged; absence of marked congestion of internal organs.

"*Typhoid Fever.*—A disease arising from a specific cause, attended by rigors, chilliness, headache, successive crops of rose spots, frequent pulse, sonorous râle, diarrhœa, fulness, resonance and tenderness of the abdomen, gurgling in the right iliac fossa, increased splenic dulness, delirium, dry and brown tongue, and prostration, and terminating by the thirtieth day. After death, enlargement of the mesenteric glands, disease of Peyer's patches, enlargement of the spleen, disseminated ulcerations, disseminated inflammations.

"*Typhus Fever.*—A disease arising from a specific cause, attended by rigors, chilliness, headache, mulberry rash, frequent pulse, delirium, dry brown tongue, and prostration, and terminating by the twenty-first day. After death, dis seminated and extreme congestions; in young persons, enlargement of the spleen."—(*Medical Times—Seventeenth Paper.*)

Before relating the individual cases, however, it may be well to notice another doctrine, entirely opposed to that of Dr Jenner, which has been advanced by the latest author on fever,—namely, Dr Dundas, of Liverpool. At the beginning of the session this gentleman was kind enough to communicate to me his views on the subject of fever, which are essentially these:—Not only are there no specific differences between the various kinds of continued fever, but there are none between this and intermittent or remittent fevers. All these disorders, according to Dr Dundas, are essentially one disease, and may all be cured by one remedy,—viz., quinine. The last statement, in various communications which I have received from him, he stated was confirmed by giving the drug to numerous cases in the various hospitals of Liverpool, and especially in the Fever Hospital there. Given in doses of ten grains, repeated at intervals of two hours, until five or six doses had been taken, he informed me that it arrested or cut short a continued, as it did an intermittent, fever. These statements deliberately brought forward, and still maintained, by Dr Dundas, who, in Brazil and in this country, has had abundant opportunities of carrying out the practice, supported, moreover, by confirmatory cases, published by different medical men in Liverpool, determined me to give this practice a fair trial.

During the period embraced by this report, nineteen cases of continued fever were treated in the clinical wards, of which four were febricula (published in the last No. of the Journal), one relapsing, three typhoid, and eleven typhus fever. In a disease so common as fever, I have thought it necessary to con-

dense the facts as much as possible, from the lengthy and accurate reports taken in the hospital books. In studying the facts, however, I must beg you particularly to remember the two doctrines I have placed before you,—viz., those of Dr Jenner and of Dr Dundas. Further, to avoid repetition, I have simply stated that the quinine treatment was employed; but you are aware that in every case this treatment was practised exactly in the manner recommended by the last-named physician. The curious effects we observed to be produced by the quinine I shall notice afterwards.

RELAPSING FEVER.

Edward Anderson, a Swede, æt. 25, hawker, admitted December 15th, 1851. Seized with rigors on the 8th; had great pain in the head, back, and over the body generally, and felt languid and depressed, though he was not compelled to take to bed till the 14th. On admission, tongue thickly coated; no appetite; much thirst; bowels constipated; slight pain of head; pulse 70, of natural strength; skin hot, but moist, presenting a well-marked eruption of small roundish and oval spots of a rose-red tint, slightly raised above the surface of the skin, entirely disappearing under pressure; widely scattered, but most abundant on the thorax. December 16th.—Slept badly; pulse 75, natural strength; sweating a good deal; much thirst, but total disinclination for food; spots more numerous. To have an effervescing draught, and six ounces of wine; also half-an-ounce of the following mixture at bed-time:—*Tinct. Hyoscyami*, ʒj; *Tinct. Kino*, ʒij; *Aq.* ℥ij. Continued to improve daily after this date; and had no feverish accession while he remained in the ward. Was dismissed on the 29th at his own desire, as he was anxious to resume his occupation, though still rather weak. The several systems carefully examined before dismissal, and found normal.

Was re-admitted on the 5th of January 1852. Had resumed his work, but on the 1st inst., 24 days after the first rigors in the former attack, was again seized with shivering, and felt pain all over the body, but especially complained of pain in the throat, and difficulty of swallowing. There was also considerable dyspnœa. On admission, tongue dry and coated; mucous membrane of fauces and pharynx much congested, and covered with a thin layer of pus; bowels constipated; slight pain over abdomen generally, but especially in the right iliac region; voice husky and indistinct; much cough of a convulsive character; little expectoration; no abnormal physical signs on examining the chest; pulse 110, full and hard; skin hot and flushed; and over the abdomen there were a few scattered spots of the same shape, and rose-red tint as before. *Vini Antimon.* ℥i; *Aq.* ℥vj; *M.* ℥i to be taken every second hour. January 6th.—Pain on pressure in iliac region increased; had little sleep; pulse 90, full, but softer. Acetate of Ammonia, with Morphia—six leeches to right iliac region. January 8th.—(8th day, or 32d from first attack), sweating a little last night; no change in urine; no pain on pressure over the abdomen. January 9th.—Eruption very distinct, and continuing well marked for 24 hours, after which it gradually faded. January 12th.—(36th day), more feverish to-day, and complains of more pain in the throat; pulse 120, sharp and vibratory; urine natural. After this date he began to improve gradually, and was quite convalescent on February 1st.

Commentary.—I have called the above a case of relapsing fever, simply because after the febrile state, counting from the first rigor, had continued for full seven days, there was complete recovery ushered in by diaphoresis. So well was this man, that he insisted on going out and resuming his occupation as a hawker. On the 24th day, however, he was again seized with all the symptoms of the primary attack, including on both occasions, a distinct exanthematous eruption of rose-coloured, lenticular, elevated spots. I am aware it may be contended that this was a case of typhoid fever. Dr Jenner would probably so consider it on account of the eruption, the iliac tenderness, and its

termination about the 30th day. But if the circumstance of a complete recovery and a distinct relapse, is to be considered as a sufficient cause for distinguishing a fever, it is scarcely to be conceived that these occurrences could ever be better characterised than in the above case. There is this difference that the relapse occurred on the 24th, and not on the 14th day. This, however, I have seen frequently happen in the epidemic of relapsing fever which occurred in this city during 1843. Though most common on the 14th day, this period was passed over, and the first relapse occurred on the 21st or 24th day. One or more relapses are not unfrequent, and it would appear as if the period of the first had been passed over.

TYPHOID FEVER TREATED BY QUININE.

Case I.—Miles Murray, æt. 25, labourer, admitted November 7, 1851. First seized with rigors on the evening of the 2d, followed by strongly-marked febrile symptoms. No contagion. On admission, features livid and anxious; skin dry and hot; no eruption. Severe frontal headache; pain in the back, and over the whole body. Slight "subsultus tendinum." Tongue moist, but furred; no appetite, but excessive thirst. Pulse 84, full, but soft, occasionally intermittent. Short dry cough, and slight dulness on right side of chest; no unusual râles. *Ordered an antimonial solution; 6 leeches to be applied to the head.* November 8th.—Slept well during the night; no delirium. Skin still dry and hot; no eruption; tongue more dry than yesterday. Pulse 82, full, but soft. *Ordered quinine, in 10 grain powders, every second hour.* November 9th, Vespere (7th day).—He has taken the powders regularly since ordered; no marked effect produced except on the pulse, which has come down 8 or 10 beats after each powder, its strength also being much reduced; he has sweated considerably to-day. Still severe headache; no delirium. Urine passed this afternoon exhibits, under the microscope, amorphous lithates; but the deposit, on standing, is inconsiderable. November 11th.—Has taken in all 205 grains of the quinine. Slight tingling in the ears this morning, but only transient. Is dull and stupid to-day. Countenance has still a worn and exhausted aspect. Slight cough, and a few scattered sibilant râles on auscultation. Pulse 76, small, and soft. *Suspend the quinine. Wine 4 oz., mixture with the sp. ether, nitr., and sol. ammon. acetat.* November 19th.—Drowsiness increased since last report, but without any other marked change. No delirium. *November 20th* (18th day).—Urine to-day loaded with lithates. Countenance rather livid. Skin not very hot; thirst moderate. No eruption has appeared. November 21st (19th day).—Feverish symptoms returned. No decided delirium, but much drowsiness, and total indifference to what is going on around him. Pulse 80, full and soft. November 23d, Vespere (21st day).—Complains to-day of uneasy symptoms in epigastrium, with much nausea. Had slight vomiting in the afternoon. November 24th.—Had an emetic ordered last night, which produced copious vomiting; nausea and pain in epigastrium relieved, followed by profuse sweating. November 30th (28th day).—Has had considerable diarrhœa during the last four days; checked by the lead and opium pills, and tannin. Slight delirium to-day; skin hot and dry; pulse 96, full, regular; cough more troublesome; bronchitic râles abundant all over the chest. December 1st.—Much sweating to-day; strength greatly prostrated; cough oppressive, and expectoration brought up with extreme difficulty; fæces and urine passed in bed. *Has 4 oz. of wine daily, and an expectorant mixture.* December 6th.—Weakness increasing; almost constant sweating, but no further change. *4 oz. of brandy in addition to the wine.* December 7th (35th day).—Was more restless than usual last night, but there is now no delirium. A bed-sore is threatening over the trochanter of the right femur. Pulse 102, small and weak. December 10th.—Cough occurring in paroxysms; weakness increasing. December 12th (40th day).—Pulse to-day 130, small and vibratory; skin cool and moist; appetite little better. ℞. *Quinæ Bisulph. gr. iv.; Ft. Pulv. tales, vj. One every 3 hours.* After taking 4 of the powders, the pulse fell to 102,

small and jerking. *Quinine stopped, and brandy and wine resumed.* Next day (41st of fever), he began to shiver about 3 P.M., and presented all the phenomena of a paroxysm of ague, the skin continuing pungently hot for about 3 hours, but without sweating. In the evening the skin was comparatively cool, and the patient felt languid and drowsy. He was ordered to resume the quinine, 5 grains every 3 hours. December 14th (42d day).—No return of shivering, or febrile symptoms. After this date he began to improve steadily; and, with the exception of slight sore throat, and return of short dry cough for a few days, had not a bad symptom during the remainder of his stay in the house. He was dismissed perfectly well on the 19th of January, having been 73 days in the ward, and 80 days having elapsed since the occurrence of the first rigor.

Commentary.—This case was observed and recorded with the greatest care, and I had no difficulty in considering it to be a case of typhoid fever, unusually prolonged, perhaps on account of the pulmonary complication. There were several distinct exacerbations, coming on with marked rigors, at intervals of seven days, followed by increased febrile symptoms. At one period this man's life was despaired of, the profuse sweatings, the diarrhœa, extreme prostration, with partial pneumonia, and general bronchitis, constituted symptoms of a most alarming character, through which, however, with the assistance of stimuli, liberally administered, he eventually safely struggled. This also was the first case of fever in which the quinine treatment was tried. It so happened, that having ordered six doses, of ten grains each, to be administered, and not seeing him on the following day, the drug was by accident continued consecutively for *eighteen* doses, at intervals of two hours each. At the end of that time, no effect having been produced on the fever, it was continued in five grain doses, so that in all he took 205 grains of quinine. Notwithstanding, not only did the fever march on, but, as we have seen, the most alarming prostration was induced. No eruption could be detected during the whole progress of the disease, though daily looked for with the utmost care.

CASE II.—Marianne Howison, æt. 11. Admitted January 16. Rigors appeared on the 10th, followed by febrile symptoms. Mother and sister had died immediately before of fever. On admission, pulse 130, full and strong; intense headach; tongue dry and brown; complete anorexia, and great thirst; skin hot, no eruption. On the 17th, *the treatment with ten-grain doses of quinine was ordered.* 18th.—Five powders were given; and the report to-day is: headach gone; pulse 94, soft; skin moist and cool; tongue moist and red. On the 19th, restlessness and heat of skin returned. On the 24th, fever was as intense as when she was admitted. 25th.—Diarrhœa. 27th.—Considerable abdominal pain on pressing right iliac region; six leeches applied. 31st.—Diarrhœa, which had formerly continued only twenty-four hours, has been present continuously for the last three days. February 1st.—Pulse weak; Sordes on lips and tongue; intellect confused; no diarrhœa. Feb. 3d.—Pulse weak and irregular, 140; is insensible. Feb. 4th.—Very restless during the night; still insensible; pulse 150, small and jerking; slight hemorrhage from the gums. Died at seven P.M.

Sectio Cadaveris.—Fifty-six hours after death—The mucous surface of the lower third of the small intestine was scattered over with round and oval elevations, becoming more crowded together nearer the cœcum. The former were of the size and form of a split pea, the latter varied in size from a sixpence to that of an almond. In the lower portion some of the elevated patches were softened and sloughing, and in one or two places had separated, forming ulcerations. The upper third of the large intestines presented also numerous round papular elevations, similar to those in the smaller intestines, —the whole exhibiting the various well-known changes of typhoid elevations and ulcerations in a characteristic manner,—the peritoneum corresponding to some of the ulcerations unusually congested, but there was no peritonitis. Some of the mesenteric glands enlarged and softened; other organs healthy.

Commentary.—This was a well-marked case of typhoid fever, which was fatal on the 25th day; and, on dissection, the intestinal lesion, characteristic of the disease, was discovered. Here also the quinine treatment was tried, with the effect at first of moderating some of the symptoms, although on the following day they returned with increased intensity. As in the last case, no eruption could be discovered on this girl, though carefully looked for. It is further worthy of observation that the mother and sister had died of a similar disease. The contagious nature of this form of fever is still doubtful, as many insist that the intestinal lesion is dependent on purely endemic causes.

Case III.—John Anderson, æt. 21, sailor. Admitted 29th Dec. 1851. On the 4th of December, having been exposed to cold, during his passage from Elsinore, he was seized with rigors, diarrhœa, and thirst, which continued several days. From this condition he was gradually recovering when the ship entered the harbour of Leith on the 24th. That night he was again attacked with rigors, great thirst, and diarrhœa, followed on the 27th by intense sudden pain in the abdomen, vomiting, and constipation. On admission, the features were shrunk and hard; skin cold and clammy; tongue red and furred; severe griping pain in abdomen, which is shrunk; no tympanitis; bowels costive; scanty urine; no headach; pulse 126, feeble and vibrating. *Twenty-four leeches were applied to the abdomen; one opium pill every two hours.* Dec. 30.—Unrelieved; mind wandering; bowels freely opened without relief; pulse very rapid, and almost imperceptible. Died at one P.M.

Sectio Cadaveris.—Twenty-three hours after death—Peritoneum purple, congested, having flakes of lymph upon the surface. It contained several ounces of dirty turbid yellow fluid, having a slight fæcal odour. Stomach and duodenum normal. About the middle of the jejunum a small ulcer one-half of an inch by one-eighth in size, penetrating all the coats of the intestine; edges pale and not raised. Mucous membrane of the lower part of ileum and cœcum mottled with slate-coloured patches; Peyer's patches prominent, and several ragged ulcers situated in their course, and in some of the solitary glands; ulcers flat, with smooth edges. Intestines contained fluid fæces of a yellow colour resembling pea-soup.

Commentary.—This was another undoubted case of typhoid fever, with intestinal disease, terminating by peritonitis, the result of a perforating ulcer. The leading facts were communicated to me with great clearness after the boy's death by the captain of the vessel, in whose log was recorded the day of the boy's attack, the remission, and the renewed attack on the 21st day. He also had observed no eruption on the skin, but of course his information on such a point is of no great value.

The three cases of typhoid fever now given have enabled you to study the principal phenomena presented by this form of fever. With regard to its diagnosis, if you rely on the characters prominently given by Dr Jenner, especially with regard to the eruption, it must be evident you will be frequently deceived. It so happens that in none of the three cases was an eruption perceived, although, in two, it was carefully sought for; and in one of these latter the nature of the disease was placed beyond all doubt by dissection, which, after all, is the only *certain* proof of typhoid fever. I have been in the habit of considering the most trustworthy symptoms distinguishing this form of fever from typhus, to be the remissions; a peculiar character of the countenance expressive of abdominal pain; the diarrhœa (especially when the stools resemble pea-soup); and marked tenderness on pressing deep down into the right iliac lesion. I acknowledge, however, that these symptoms, in the absence of an epidemic of typhoid fever, are often deceptive, even when the disease has continued beyond the 30th day.

Typhoid fever is, on the whole, a rare disease in Edinburgh. It is common, however, on the opposite coast of Fife, and at Linlithgow. The late Dr John Reid used to remark, when he was pathologist to the Infirmary, that all the bodies he opened affected with typhoid ulcerations of the intestines, came from

one or other of these places. In Paris, and in many places on the continent, on the other hand, it is the prevailing form of fever. In the fever wards of this infirmary, you have the most extensive opportunities of studying typhus; in the hospitals of the continent, and especially at Paris, Berlin, Prague, or Vienna, you will see typhoid or enteric fever on a large scale. These facts serve to clear up much of the confusion which has entered into the discussions concerning continued fever by foreign and domestic writers. They also explain why the doctrine of Broussais, who conceived typhus to be gastro-enteritis, —although everywhere on the continent, adopted for a time,—was, from the first, rejected as false by this school.

Now it is an interesting inquiry to ascertain what are the causes which should occasion such a general typhoid fever abroad, and such a general typhus in this country. For my own part, I have been led by long observation of the fever, both here and on the continent, to form the opinion that it is in some way connected with the diet, which, among the lower orders, varies greatly in France or Germany and in this country. Acid wines and food, impoverished diet, excessive use of vegetables and fruit, predispose on the continent to intestinal disorders. I have thought this theory strengthened by the fact that, in 1846-7, we had a remarkable epidemic of typhoid fever in Edinburgh at the time when, from failure in the potato crop, various kinds of substitutes were employed by the people, and scurvy became common. Be this as it may, that epidemic gave me an opportunity of carefully investigating the morbid anatomy of the disease in sixty-three bodies of persons who died of fever, which I carefully examined, with the following results:—

Morbid Anatomy of the Edinburgh Epidemic Fever during the Winter Session 1846-7, *when Typhoid Disease was prevalent.*

Spleen.—The organ most frequently affected was the spleen. In the majority of cases it was more or less enlarged and softened, presenting a mahogany-brown colour, and creamy consistence; so that when pressed, the whole of its parenchyma could be squeezed out of its capsule. In ten cases the spleen contained yellow fawn-coloured discolorations with abrupt margins, sometimes diffused in masses varying in size from a walnut to that of a hen's egg, at others, disseminated in miliary spots through the organ. In two cases, these altered masses of the spleen's substance had softened and burst into the peritoneum, causing fatal peritonitis. In another case a distinct line of separation was observed to be forming round a mass about the size of a walnut.

On examining this altered texture in the spleen with a power of 250 diameters linear, it is found to consist of—1st, numerous molecules and granules; 2d, free nuclei; 3d, compound granular cells of various sizes; 4th, fragments of the fibrous tissue and fusiform corpuscles of the organ. The granular cells were frequently ruptured, more or less broken down, and appeared to me at that time to constitute the structural character of a new formation which had been described by Rokitanski and other German pathologists, as typhus deposit. This deposition, according to them, bears the same relation to the constitution of the blood in cases of typhus fever, as tubercle and cancer do to the tubercular and cancerous cachexia. Although the facts described by Rokitanski and others, as well as the structure of this altered tissue as determined by myself in 1846-7, are quite correct, further observation has convinced me that these alterations are not peculiar to typhus, and do not constitute a distinct form of exudation. They consist, in point of fact, of a peculiar degeneration of the splenic pulp, which follows a greater or less increased growth of the glandular cells,—a peculiar lesion which I have described in another place.—(See *Memoir on Leucocythemia.*)

Lungs.—The organs most frequently affected after the spleen were the lungs. The most common lesion was bronchitis, the bronchial lining membrane being of a deep mahogany or purple colour, more or less infiltrated with serum or exudation. The fine bronchial tubes were frequently filled with a muco-

purulent matter, and in a few cases were choked up with a reddish-brown gelatinous substance, more or less fluid,—probably a modified form of the exudation described by Remak, and discovered by him in the sputum. The apices of the lungs were very commonly œdematous, yielding on section a copious grayish frothy fluid. In fifteen cases the lungs were more or less consolidated by exudation, which seldom presented the characters of normal hepatization. It was sometimes of a dirty yellow tint, at others of a brownish chocolate colour, existing in masses of irregular outline, and of variable size, resembling the discoloured portions of the splenic pulp, formerly alluded to. In three cases there was pulmonary apoplexy.

The dirty yellow or chocolate-coloured exudation into the lungs, was ascertained, on microscopic examination, to consist of,—1st, numerous molecules and granules, filling up the air vesicles, and infiltrated into the areolar tissue; 2d, naked nuclei; 3d, enlarged and isolated epithelial cells, with multiplying nuclei; and 4th, several compound granular corpuscles. This material was also supposed to belong to the so-called typhous deposits, but is more probably in part an altered exudation, dependent on the constitution of the blood, and partly a desquamation of the epithelium, with tendency to multiplication of inclosed nuclei.

Intestines.—The intestines presented the lesion so well described by Bretonneau, Louis, Cruveilhier, and others (dothinenteritis, typhoid ulcer, &c.) in nineteen cases. It consisted of a peculiar alteration of the round and oval glandular patches of the small intestine, exhibiting in its first stage a flesh-coloured mass, raised above the mucous membrane, in the round patches presenting the form of a pimple, or a split pea, and in the oval ones an abrupt elevation, resembling an inverted dish. In the second stage this mass was more or less softened, especially round the edges, exhibiting a tendency to separate and slough. In the third stage, the slough had separated, leaving an ulcer, with abrupt edges the size of the gland affected, of various depths, occasionally passing through the muscular, and resting on the peritoneal, coat of the intestine. In this latter case, the peritoneum externally often presented a red or violet patch of congested vessels, indicating the ulcer below. The elevated patches were observed occasionally to extend as high as the duodenum, and as low as the rectum. In one case numerous dothinenteritic elevations, about the size and shape of a split pea, extended all over the ascending and transverse colon. In a few cases the isolated follicles in the large intestine were observed swollen and empty, presenting in their centre a dark blue or black spot. In others, the round and oval patches of the small intestine exhibited a grayish or slate-blue appearance. Perforation of the intestine from ulceration, causing fatal peritonitis, occurred in three cases. Dysentery, with flakes of lymph attached to the mucous surface over the ascending and transverse colon, was associated with intense dothinenteritis in one case. Oval and round cicatrices, exhibiting different stages of the healing process of the intestinal typhous ulcer, were observed in two cases.

On examining the matter found in the intestinal glands in the above cases, it was found to consist of numerous molecules and granules, associated with free nuclei and cells of the glandular sacs, which were unusually distended, and filled with cell elements, in various stages of development and disintegration. In this respect it closely resembled the altered substance of the spleen, formerly described, and indeed appeared to consist of the same glandular lesion.

Mesenteric Glands.—In all the cases where the intestinal ulcerations were recent, the mesenteric glands were enlarged, soft, and friable, and of a grayish or reddish-purple colour. Some of these glands reached the size of a hen's egg. On section they presented a finely granular surface, of a dirty yellow-grayish or dark fawn colour, and their substance was generally soft and friable, but sometimes, in one or more parts of the swollen gland, broken down with a fluid of creamy consistence.

On examining this creamy matter, or the fluid squeezed from the gland,

with a power of 250 diameters linear, it was found to contain numerous cells, generally spherical, varying in diameter from the 1-150th to the 1-35th of a millimetre. In some cases numerous nuclei were contained in the cell, occupying three-fourths of its interior, generally about the 1-200th of a millimetre in diameter. At other times from one to four of these nuclei were seen scattered within the cell. On the addition of acetic acid the cell wall was rendered very transparent, whilst the nuclei were unaffected. Many of them were free, and at first looked like altered blood corpuscles, from which they were at once distinguished by the action of acetic acid.

Blood.—The blood, in the great majority of cases, was fluid, and of a dirty brownish colour. In those instances, however, where the disease had been protracted, and especially in such as presented well-marked glandular disease, firm coagula were found in the heart and large vessels.

Other Lesions.—With regard to the other lesions observed in the 63 bodies, it may be said that in two there were glossitis, and laryngitis with tonsillitis; in one, abscess of the kidney; and in one, abscess of the posterior mediastinum. The brain did not appear to participate much in the disease. It presented only occasional congestion, with slight effusion into the subarachnoid cavity, or into the lateral ventricles. In seven bodies no lesion whatever could be discovered.

Such is a summary of the appearances observed in all the examined bodies of patients who died of fever during the prevalence of the typhoid form of the disease, during 1846-7. It is not contended that they were all those of typhoid fever. On the contrary, there can be no doubt some of them were cases of pure typhus, but the proportion of one to the other I have now no means of ascertaining. On the whole, however, the account given is a faithful description of the frequency with which the individual lesions occurred, and of their minute structure.

With regard to the nature of typhoid, as of all other forms of fever, we know little; but, from what has been said, it is impossible to avoid seeing, that the spleen, mesenteric and intestinal glands, are especially liable to be affected. Now these glands constitute part of an apparatus which, recent observations have induced me to believe, secrete the blood (See Memoir on Leucocythemia); and if so, we begin to catch a glimpse, at all events, of the connection between alterations of these structures and of the blood in fever. Further researches, however, are required to determine the nature of this connection, as well as how far in this disease the glands operate upon the blood, and the blood upon the glands.

TYPHUS FEVER TREATED BY QUININE.

CASE I.—Mrs Macdonald, a nurse in the Infirmary, æt. 50, admitted November 10th. Seven days ago was unusually exposed to cold, and two days afterwards experienced vomiting, pain in the back, and epigastrium, with headach, and prostration of strength, which last symptom was apparently increased by a purgative taken on the 8th. On admission, the skin was exceedingly hot; pulse 102, strong; tongue white and furred; great thirst, and headach; anorexia and nausea; slight bronchitis. *On the 11th, an emetic was ordered, and two hours after its operation the quinine treatment to be followed.* On the 12th, it is reported that she took four quinine powders of 10 grains, at intervals of two hours, but vomited the fifth. Three others, however, were retained during the night, so that 70 grains have been administered. At present, she is in no way relieved. Skin hot and dry; pulse 100, strong; tongue furred; pains in head and epigastrium unabated. Eight leeches to be applied to the head, and *Quininæ Sulph. grs. v. every two hours.* Nov. 13th.—*Has taken five more quinine powders.* Pulse now 78, full; considerable vomiting, and pains in epigastrium; other symptoms the same. Cold douches to the head; warm fomentations to the epigastrium. *Pill of bismuth and opium every four hours.* Nov. 14th.—Head and stomach much relieved. It is reported that last night the limbs were partially convulsed, and her eyes

fixed, a state that lasted seven minutes. Nov. 15th.—Confusion of intellect, and restlessness. Pulse rapid and weak. ℥iv. *of wine.* Nov. 17th.—Has remained in the same condition. Slight puffing of the cheeks observed on expiration. Nov. 18th.—Puffing of cheeks more marked; unable to move the right arm; great prostration. *Wine* ℥vj. *Blister to the head.* Nov. 19th.—Died comatose.

Commentary.—No examination of this woman's body could be obtained, and we are therefore in doubt as to whether an exudation had or had not taken place between the membranes of the brain. The cerebral complication, however, was in this case well marked. At first, indeed, there was nothing more than usual; but the vomiting was obstinate, and latterly the convulsion, and partial paralysis indicated distinctly the organ affected. Having previously resolved to try the quinine treatment, it was given energetically in this case, but without any effect on the progress of the fever. It may be even contended that it did harm, seeing we had a cerebral complication to deal with. Of this, however, at an early period, we could not judge, although it appears to me that the quinine practice is contradicated in such cases.

Case II.—George Johnstone, boot-maker, æt. 21, admitted 8th December 1851. Had severe rigors on 29th November, which were followed by the usual feverish symptoms. No exposure to contagion. On admission, tongue densely furred, coated, and cracked; no appetite; intense thirst; skin hot and dry; confused in his ideas, without great pain in the head; pulse 108, full. Dec. 9.—Slept very ill, and continues the same as yesterday. Pulse 120, full. ℞. *Ol. Ricini*, ℥vj. *Vespere.*—℞. *Sulph. Quinæ*, ʒj; *Div. in Pulv.*, vj. *One every two hours.* Bowels freely moved in the afternoon; great heat of skin; much mental excitement; pulse 120, full and strong; no eruption. Dec. 10.—Slept well; no restlessness; skin cool and moist; no headach; slight singing in the ears; pulse 87, of good strength. Pulse rose to 88 during the day, and in the evening was full and strong. *Quinine repeated,* 10 *grains given at first, then* 13 *grains every two hours.* Dec. 11.—Pulse 84, of good strength; thirst great; skin moist; no eruption. Dec. 12.—(14th day), thirst less; some appetite; no eruption; slight deposit in urine. Improved from this time, and was dismissed, January 5th.

Commentary.—This was a slight case of fever from the beginning, with no alarming symptoms, recovering on the 14th day. Whether this result was in any way owing to the quinine, was very doubtful, for, as we shall see, there were other cases very similar, in which the fever was of no longer duration. When first given, it certainly brought down the pulse, and all the symptoms abated. On their return, therefore, the treatment was again had recourse to, and the dose increased to thirteen grains. On this occasion, however, no further benefit was obtained; and it appeared to me that the disease terminated with critical sediment in the urine, on the fourteenth day, in the usual manner. There was no eruption in this case.

Case III.—John Craik, blacksmith, æt. 23. Admitted January 5, 1852. On December 28th, had severe rigors, followed by feverish symptoms, and during the night, severe cough, and much expectoration. On admission, tongue red and moist; slight sore throat; no appetite; constipation; pulse 80, of good strength; severe cough, and considerable expectoration, tinged with blood; mucous râles are heard over chest, chiefly at base of lungs; skin soft and dry; no eruption, or exposure to contagion. January 7th.—Bowels freely opened; cough very severe. *Ordered saline mixture; blister to front of chest.* January 8th.—(11th day), Very restless; delirious; drowsy and stupid; cough abated; pulse 108, weak. *Vespere.*—Pulse 121, quick; skin hot and dry. *Quinine treatment ordered.* January 9th.—Skin cool and moist; pulse 90, weak; tongue moist and red; extreme deafness. January 10th.—Slight diaphoresis. January 11th.—(14th day of fever), Skin hot and dry; flushed and delirious; marked eruption over chest and abdomen; great thirst; sordes on lips and

teeth; tongue red, and most dark in centre. January 12th.—Delirious; eruption remains; sordes disappearing; skin hot and dry; cough severe; crepitation marked at base of right lung; no dullness, but marked resonance. *Ordered antimonial mixture.* January 13th.—Countenance flushed; pulse rapid and weak; great prostration. *Blister to right side; wine,* ℥iv. January 14th.—Symptoms urgent. January 15th.—Great thirst; tongue foul; crepitation gone, and the respiration is heard very indistinctly; vocal resonance well marked. January 17th.—Improving; no dullness, nor vocal resonance; some sibilant râles; slight deposit in urine. Steady improvement until February 20, when there was œdema of lower limbs; urine normal. Is now quite convalescent.

Commentary.—In this case it will be observed that, although the quinine produced at first an apparent improvement, the fever, with delirium and the usual symptoms, shortly returned, and ran a rather protracted course, owing to the pulmonary complication.

CASE IV.—Anne Dowie, æt. 18, servant. Admitted December 10th, 1851. Seized with pain in the head, heat of skin, and general debility, Dec. 3d. Next day general pain over the body, which has continued since. On admission—Pulse 120, feeble; tongue dry, red, and fissured; no appetite: great thirst; bowels constipated; skin hot, and covered with a clammy sweat, and presenting on the chest and arms an eruption of numerous minute petechial spots, which have existed for some days; slight cough and expectoration; scattered bronchitic râles over chest. Dec. 11th.—*The quinine treatment was ordered.* After the fifth dose of 10 grs., slight deafness, ringing in the ears; one more dose taken, after which the medicine was stopped. Dec. 12th.—Pulse 80, "excessively small and weak;" surface cooler. In the afternoon, the pulse was 86, strength much increased; skin warm and moist; tongue dry, rough and fissured; much thirst; respirations 43 in the minute; slight subsultus. 13th.—Pulse 84, of good strength; skin moist; eruption unchanged; lips covered with sordes; tongue dry and cracked. On the 14th, she had smart diarrhœa, which was checked by an astringent mixture. 15th (12th day).—Appearance of patient much better; pulse 88, of good strength; eruption faded; tongue cleaner. 17th (14th day).—Cough troublesome; a good deal of opaque dirty-looking muco-purulent matter expectorated; moist râles heard on auscultation; thirst and anorexia continue; urine turbid, but without sediment. 19th (16th day).—Urine loaded with lithates; patient improving. After this date, she recovered rapidly, and was discharged on the 15th January, quite well.

Commentary.—This was a well-marked case of petechial typhus, in which the quinine treatment was tried, without apparently in any way arresting its course, although the physiological action of the drug upon the pulse was remarkably well characterised.

CASE V.—Isabella Adamson, æt. 20, servant. Admitted December 19th 1851, with eczema of the scalp and face. Rigors appeared, Jan. 4th, followed by febrile symptoms. Rose-coloured exanthematous spots appeared on the chest and arms on the 9th. *On the 10th, the treatment by quinine commenced.* On the 11th, the immediate effects of the quinine have disappeared, and the report is—Pulse 100, full, and compressible; had no sleep; pain in head very intense; no sweating; tongue furred and cracked; eruption darker. 14th.—Confusion of intellect; vertigo; pulse 110, weak and intermitting; sordes on lips and tongue; subsultus tendinum. 17th.—Head symptoms have been relieved by a blister; and she now began slowly to improve. On the 24th, pulse 80; returning appetite; sordes disappeared. On the 28th, convalescent.

Commentary.—This also was a remarkably well-characterised case of fever, of considerable severity, evidently caught in the ward, running its usual course, notwithstanding the quinine treatment was commenced so early as the sixth day. The eruption here presented rose-coloured spots at the commence-

ment, becoming darker afterwards. Seven cases of fever treated by quinine have thus been recorded, which we may now contrast with seven cases treated in the ordinary way.

Case VI.—Anthony Kennachar, labourer, æt. 20. Admitted November 12, 1851. On the 7th, had rigors, followed by confusion of head and general feverish symptoms. No exposure to contagion. On admission, tongue furred and white; intense thirst; no appetite; expression anxious, only slight headach; no eruption. Nov. 13.—cough severe; dullness at lower part of left lung; cough mixture. Nov. 20.—Feverishness gone; sleeps well; expression good. Dismissed on Dec. 8, 1851.

Case VII.—Laurence Cochrane, labourer, æt. 43. Admitted December 1st, 1851. Had first severe rigors, Nov. 28th, followed by febrile symptoms. No exposure to contagion. Had fever six years ago. On admission, tongue furred and moist; appetite gone; constipation; pain in back and loins, and great weakness. Complains of cough; no expectoration; chest resonant, and crepitation is heard at base of left lung; pulse 100, full and regular. Dec. 2d. —Bowels well moved; pain unrelieved; appetite returned; no eruption. Dec. 12th.—Fever disappeared, but very weak. Dismissed Jan. 12th.

Commentary.—Both these cases, although complicated with pulmonary disorder, ran their usual course, and in this respect resembled Case II., in which quinine was given. In neither was there any eruption.

Case VIII.—Isabella Stevenson, æt. 44, washerwoman. Admitted November 10th, 1851. On the 3d, first experienced pain in the head, followed by sweating, but says she had no rigors. She was in bed, complaining principally of cephalagia, during the whole of last week. On admission, the skin is dry and hot, but at night always bathed in perspiration. No eruption; tongue furred; no appetite; thirst moderate; intense headach, with occasional stupor; pulse 120, small, threadlike. *Cold to the head, and stimulants.* On the 12th, crepitation was heard in the left lung posteriorly. 13th.—Great dyspnœa; moist and dry râles over anterior of chest. These symptoms increased, and she died Nov. 15th.

Sectio Cadaveris.—Forty-eight hours after death—Both lungs anteriorly were emphysematous in the highest degree, presenting numerous bullæ, with deep fissures between them, with patches of collapsed lung here and there. If anything, the left lung was most affected. Posteriorly, both lungs more or less collapsed, and on section, the lining membrane of the bronchi is deeply congested, and the tubes, on pressure, yield an abundant muco-purulent discharge. Spleen small, weighing one ounce and a half; brain and other organs healthy.

Commentary.—This woman came into the ward on the same day as Case I., the fever was equally severe, and if anything the headach was more violent. It was resolved to give quinine in one case and treat the other in the usual way. It so happened that both died.

Case IX.—Margaret Menzies, æt. 16, servant. Admitted December 28, 1851. Seized with lassitude and febrile symptoms on the 22d, but without distinct rigors. On admission, pulse 100, full; tongue coated; headach and vertigo; skin dry and hot, with rose-coloured eliptical spots scattered over the abdomen and chest, which appeared this morning; they are of mulberry colour on the arms. January 1.—Urine loaded with lithates; eruption disappeared; skin cool; pulse natural. January 3.—Convalescent.

Case X.—Christina Swan, servant, æt. 25. Admitted December 16, 1851. Had rigors on the 14th, followed by febrile symptoms, but had headach and other premonitory symptoms on the 11th. The day before admission (13th) an eruption appeared on the body. On admission, pulse 120, small; tongue florid at edges, furred at the sides; no appetite; great thirst; cough. The entire surface is covered with a mulberry-coloured eruption, in small crescentic patches, and though not raised, strongly resembling that of rubeola. Eyes

red and suffused, not sensitive to light. December 19.—Was delirious last night. Mouth and teeth covered with sordes; tongue dry and cracked; is now insensible; pulse 120, small. Subsultus tendinum, bronchitis on both sides, with pneumonia in lower half of right lung. December 25.—Since last report, constant low delirium, which to-day is somewhat diminished. Cough and expectoration very troublesome. Absence of respiration from right back, with pealing vocal resonance. Pulse rapid and weak; eruption faded. *Blister to head. Wine ℥vj., and brandy ℥iv.* December 29.—No delirium, but lies in a comatose state. A lateritious sediment in the urine has appeared, and a swelling in the right parotid gland. Pulse 98, more full. January 1.—Consciousness returning; cough much diminished, and respiration audible in right back; skin cool. An abscess forming in the neck, below right side of jaw. From this period convalescence was slowly established; the abscess was resolved, and she was dismissed February 2.

Commentary.—This was a very severe case of typhus, with pulmonary complication, which, however, by means of stimulants liberally given, struggled through on the 21st day. The eruption in her case was very peculiar, closely resembling that of rubeola, which it was maintained to be by several persons who saw it. It appeared on the second day after the rigor. But there was none of the intolerance to light, or coryza of measles; and, moreover, she and her friends stated that she had previously had the disease. Under these circumstances, it is probable that it constituted the "mulberry rush" of Jenner, appearing early. The question, however, is a difficult one to decide.

CASE XI.—Bridget M'Fadyen, æt. 20, labouring woman. Admitted December 17, 1851, with psoriasis of the arms and legs. Rigors appeared January 4, followed by slight febrile symptoms, which became fully established on the 10th. 11th.—Delirious; face flushed; pulse 120, rather strong, and jerking; no eruption. 17th.—Quite unconscious. *Head shaved, and blister applied.* 18th.—Head relieved; pulse rapid and weak. Ordered 4 oz. of wine. On the 24th, sediment of lithates in urine. She gradually improved after this date, and on the 26th was convalescent.

(*To be continued.*)

CLINICAL SURGERY.

REPORT OF SURGICAL CASES OCCURRING IN HOSPITAL PRACTICE.

BY R. J. MACKENZIE, ESQ., F.R.C.S.E., ETC.

Arterial Hemorrhage.

No rules in surgery have been more insisted upon than those which are to guide the surgeon in the treatment of hemorrhage from a wounded arterial trunk. The valuable precepts on this subject, inculcated by John Bell in the beginning of the present century, have been more recently confirmed and more strongly urged on the attention of the profession by the writings of Mr Guthrie, who has collected from all quarters a sufficient number of cases to form an invaluable work of reference on the subject.[1]

Distinctly, however, as the principles of treatment have been stated by these and other surgical writers, in no cases in surgery do we find that established rules are more frequently departed from in practice than in those of bleeding from arterial trunks.

The rule, that a bleeding artery is to be exposed, and a ligature placed on each side of the bleeding point, is frequently set aside, and the Hunterian operation as for aneurism (the application of a single ligature to the artery, at some distance on the cardiac side of the bleeding point) resorted to. Such a proceeding is frequently followed by permanent suppression of the hemorrhage, and such

[1] Guthrie on Wounds and Injuries of Arteries. Reprinted from Lancet, 1846.

cases, being from time to time recorded, give confidence in a plan of treatment, which is at best uncertain in its results, while they tend to render apparently doubtful the necessity for resorting to the more embarrassing and arduous operation, so strongly enforced by the authors I have mentioned, of applying ligatures above and below the bleeding point of the vessel.

That exceptions occur, in which the surgeon is compelled to trust to the Hunterian operation as the only means of arresting the hemorrhage, no practical surgeon can doubt; and what appears most desirable at present is, that rules should be laid down by surgical writers, establishing as nearly as possible the circumstances in which the surgeon is justified in departing from the normal operation, and resorting to the uncertain means of arresting the bleeding by applying a single ligature to the artery at a greater or less distance on the cardiac side of the wounded point.

The two principal conditions which forbid the operation of exposing and tying the vessel at the wounded point appear to be,—1st, where it is impracticable, or where the extent of wound necessary to expose the bleeding point would be so great as to render such a proceeding unjustifiable; and, 2d, where the artery is so disorganised at the part from which the hemorrhage proceeds as to render it incapable of assuming the healthy changes necessary for the safe separation of the ligatures.

As instances of the first of these conditions, may be mentioned wounds of the internal carotid from the fauces, punctured wounds of either branch of the carotid in the upper part of the neck, punctured wounds of the femoral artery between its entrance into the sheath of the adductor magnus and the popliteal space, or of the anterior tibial as it passes through the interosseous ligament.

In the first, and perhaps in the last of these instances, the operation may be said to be impracticable; in the third, the depth of the wounded vessel would necessitate such extensive division of parts as to render the operation unjustifiable, and in the case of a wound of one of the divisions of the carotid near the angle of the jaw, the impossibility of commanding the hemorrhage during the operation must render the exposure of the wounded vessel a most embarrassing proceeding, and one likely to fail in the hands of the most skilful operator.

The practice which, I presume, would be followed by most surgeons under such circumstances would be, in the first place, the accurate closure of the edges of the small wound in the integuments, and the application of firm pressure, by means of a compress of lint over it, so as to obtain union of the external wound, and to favour the possible closure of the breach in the arterial coats; and the subsequent application (in the event of the formation of aneurism) of a single ligature to the artery on the cardiac side of the seat of injury.

Exception may be taken, perhaps, to this practice in some of the instances I have cited; but it is the practice which, I believe, as a general rule, must be followed in such cases.

It would be a more difficult matter to lay down rules which are to guide the surgeon as to the second condition, as to the capability of the artery to bear the application of ligatures, when its coats are in a morbid condition as a result of injury or disease.

In cases of gunshot wounds of arteries, we have the authority of Mr Guthrie and other military writers, to prove, that the artery in the close vicinity of the contused wound made by the ball, is in a condition in which ligatures may be applied to it with safety. In secondary hemorrhage after amputation, it has been proved in numerous instances that the opening up of the stump, and the application of a ligature at a very short distance above the ulcerated opening in the bleeding artery, is the safe and proper practice, and generally succeeds in permanently arresting the hemorrhage.

Many cases, however, occur in which the ordinary rules of practice must be departed from, and the publication of all cases, successful and unsuccessful, bearing on the question, seems desirable, as establishing *data* from which practical rules may be deduced.

Hemorrhage from an Ulcerated Opening of the Popliteal Artery—Ligature of Femoral Artery.

Charles Macqueen, æt. 18, was admitted into the Royal Infirmary, under Mr Syme's care, March 7, 1842, on account of a deep-seated abscess in the popliteal space. Mr Syme opened the abscess, and on introducing the finger into the opening, the matter was found to have separated the vessels from the bone, the artery being felt bare and exposed to the extent of an inch and a half superficial to the finger.

Unhealthy ulceration followed the opening of the abscess, and the patient being very anxious to return home, he was permitted to leave the hospital.

I received an urgent message to see him immediately on the 31st, as he had suddenly lost a large quantity of blood from the opening in the ham. On arriving at his house, I found him much exhausted from the loss of about three pounds of blood. The hemorrhage had been arrested by my friend Dr Cleghorn, whom I found compressing the femoral artery in the groin. On introducing my finger into the opening in the popliteal space, and clearing the cavity of the coagula which it contained, I found it was impossible to distinguish one tissue from another, the entire soft parts, forming the deep wall of the cavity, being in a sloughing condition.

Relaxation of the pressure in the groin instantly renewed the hemorrhage, the blood escaping through the disorganised tissues at various points.

Compression being made in the middle of the thigh, I exposed and placed a ligature around the superficial femoral artery in the usual situation above the crossing of the sartorius muscle. The bleeding was at once arrested, but the patient, exhausted by the great loss of blood which had taken place before the vessel was tied, sank, and died twenty-four hours after the operation. There was no renewal of the bleeding subsequently to the application of the ligature.

In this case there seemed no choice as to the practice which was to be pursued. The application of ligatures near the bleeding point was clearly inadmissible, the artery being imbedded in sloughing tissues, and its coats being already partly disorganised. The ligature of the femoral artery at once arrested the hemorrhage, and, had the patient survived, might have proved effectual in arresting it permanently. In the event of the patient having rallied, and of the hemorrhage having been renewed through the collateral circulation, amputation would have been performed.

Some years ago, I published the details of a case, in which the application of a ligature to the subclavian artery was successful in permanently arresting hemorrhage from the axillary artery, in a scorched wound made by the thrust of a red-hot poker.[1]

The condition of the artery in this case was very similar to that of the popliteal artery in the case I have just related. It was largely exposed at the bottom of a foul sloughing sore, in the midst of which its coats had been disorganised and perforated.

As the practice pursued in this case has been made the subject of comment by Mr Guthrie,[2] and as I still believe that the performance of the operation which was resorted to was as correct in principle as it proved successful in practice, I shall here take the liberty of answering the objections brought forward by Mr Guthrie to the treatment which was followed.

The arterial hemorrhage first occurred in this case eight days after the receipt of the injury, during the sloughing which followed a deep cauterised wound in the hollow of the axilla. The patient had already lost a large quantity of blood before I saw him. On removing the dressing which had been applied, no bleeding occurred; and, as I was uncertain whether the hemorrhage had occurred from the main trunk, or from one or more of its branches, a compress was applied firmly to the bottom of the wound, and supported by a bandage.

On the following day, the uneasiness caused by the tightness of the bandage

[1] Northern Journal of Medicine, March 1846.

[2] Guthrie on Wounds and Injuries of Arteries, p. 49.

induced the patient to loosen the dressings, when the hemorrhage recurred so suddenly, and with such violence, as to leave no doubt as to the main artery being its source.

The patient was now much exhausted from loss of blood, and a recurrence of the hemorrhage to any extent would probably have proved at once fatal.

A ligature was applied to the subclavian artery, by which the hemorrhage was permanently suppressed. The wound in the axilla speedily assumed a healthy action, and the patient made a perfect recovery.

This case appears to me a good illustration of the conditions in which the ordinary rule of applying ligatures on each side of the wounded point must be departed from.

The artery, exposed and bleeding in the midst of sloughing tissues, itself disorganised, was in no condition to bear the application of ligatures.

But Mr Guthrie does not admit the disorganised state of the artery as any reason for deviating from the ordinary rule of practice, and strongly censures the treatment which was pursued. The vessel should, in Mr Guthrie's opinion, have been exposed at the bleeding point, by cutting across the pectoral muscle, and laying bare the whole cavity of the axilla, and ligatures applied to the artery where its coats appeared sound above and below the opening.

The first objection which presented itself to this proceeding was the fact, that the patient was already much exhausted by loss of blood, and the hemorrhage which must necessarily have occurred in such an operation, however dexterously performed, would not improbably have been attended by fatal consequences.

In the second place, the artery was in an unsound condition in the vicinity of the bleeding point, the ligatures consequently, to have embraced sound parts of the vessel, must have been applied at some distance above and below the opening; and, from the situation of the bleeding point, the large collateral branches would probably have communicated with the artery in the space included between the ligatures, rendering the risk of a recurrence of the hemorrhage as great as after the single ligature of the subclavian.

The accompanying rude diagrams of the artery, and its chief inosculating branches, will render this more intelligible.

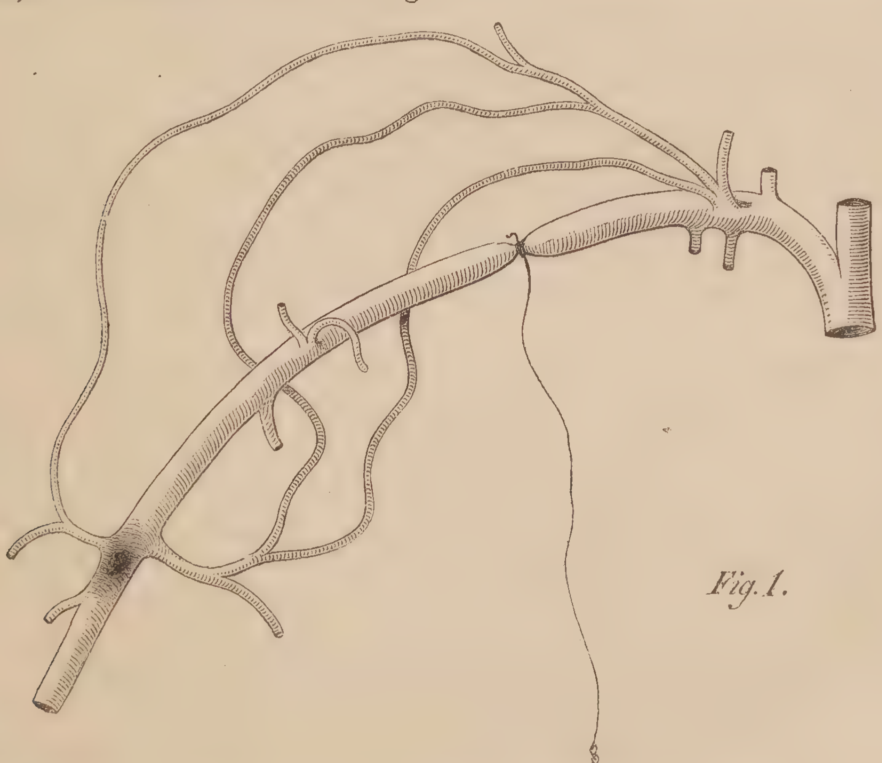


Fig. 1.

The opening in the artery was, as nearly as we could judge, in the situation

here represented, in the close vicinity of the subscapular and posterior circumflex branches. The ligature of the subclavian artery (as shown in the first diagram) certainly left these vessels free to renew the current in the axillary artery, and the risk of a recurrence of the hemorrhage was thus incurred.

But this risk would have been equally hazarded by the other operation, if the situation of the bleeding point was correctly estimated.

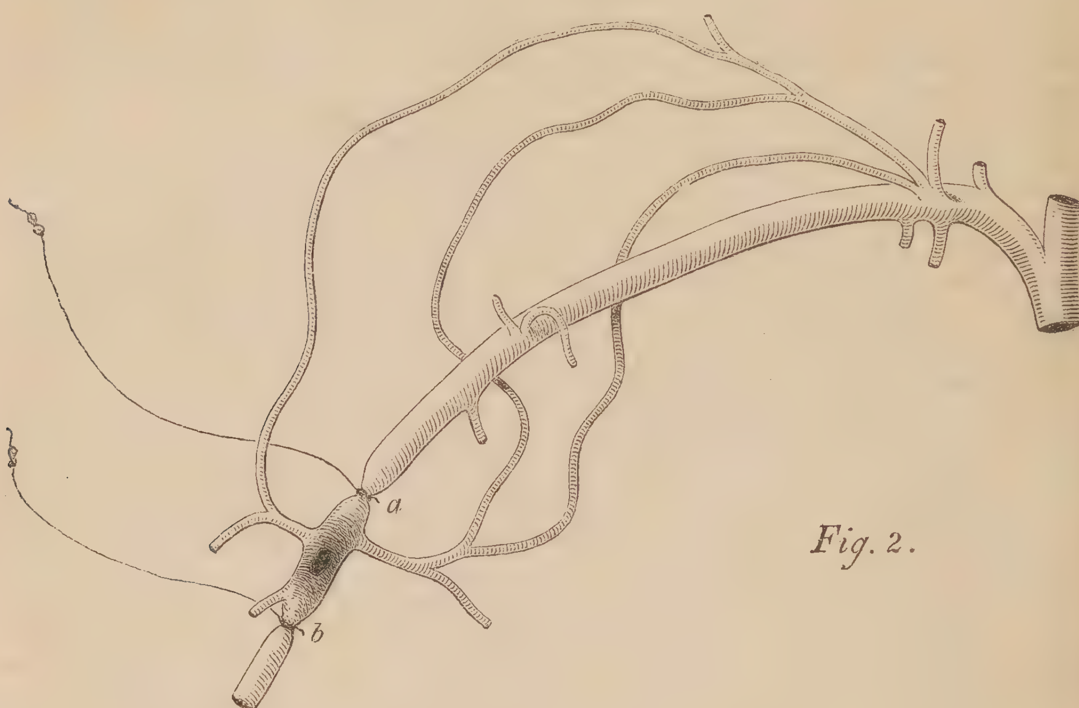


Fig. 2.

The ligatures must, as far as could be ascertained, have been placed (as shown in the second diagram at *a* and *b*), so that the large inosculating branches would have poured their blood into the artery between them.

An additional risk of gangrene of the limb would likewise have been incurred by the extensive incision through the anterior fold of the armpit, in which other collateral branches would necessarily have been divided and tied; and, lastly, it was necessary, in the circumstances of the case, to take into consideration the permanent maiming of the right arm, which must have been the consequence of division of the pectoral muscle.

These considerations appear to warrant the conclusion, that the practice followed in this case was correct, whilst, at the same time, they do not tend to invalidate the principles of treatment, which have been so strongly insisted on by Mr Guthrie, as applicable in cases of simple wounds.

In the event of the bleeding having recurred in the above case after the ligature of the subclavian artery, amputation at the shoulder-joint would have been resorted to. By making a large flap on the outer side of the shoulder, and carrying the knife directly downwards from the joint through the axilla, the vessel would have been divided near the injured point, and, if necessary, it would then have been easily exposed at a higher point and tied.

Rupture of an Aneurism of the upper part of the Posterior Tibial Artery; Aneurism laid open, and the Artery secured by Ligatures above and below the Opening in its Coats.

J. M., æt. 35, a letter-carrier, who had been, for some months previously to my seeing him (September 1, 1847), under the care of Dr Burn, on account of a prolonged attack of acute rheumatism, had suffered, during his recovery, from

numbness and cramp of both feet, occasioned apparently by a hard and painful swelling in the upper part of the calf of each leg. The swelling in the left limb slowly increased in size, whilst that in the right remained stationary. The patient never experienced any feeling of pulsation in either tumour; and I am informed by Mr Spence, who saw the case in consultation with Dr Burn, that no pulsation could ever be detected in the tumour of the left limb. The tumour having continued to increase slowly in size for upwards of two months, and the sufferings of the patient becoming more severe, it was deemed expedient to make a small opening at the lower part of the swelling. No satisfactory information, however, was elicited by the puncture, a small quantity of dark-coloured blood only escaping from the opening. A small quantity of pus was discharged from this opening for a few days, when, on the night of the 31st of August, a sudden gush of florid blood from the opening disclosed the hitherto obscure nature of the case.

In the absence of Mr Spence from Edinburgh, I was sent for, and found that, although the hemorrhage had been arrested by Dr Burn, a large quantity of blood (upwards apparently of two pounds) had been lost before his assistance had been procured. I found the limb enormously distended from the ham to within five or six inches of the ankle. Stimulants had been freely administered, but the patient was in a state of extreme depression, the cold surface of the body, his contracted features, laboured respiration, and whispering voice, giving evidence that the powers of life were nearly exhausted.

No pulsation could be detected in the swelling, or in the posterior tibial at the ankle. The opening, from which the bleeding had taken place, was situated at the lower part of the calf of the leg, about the junction of the muscular and tendinous portions of the gastro-cnemius.

In consulting with Dr Burn as to what was to be done, it was evident that one of two courses must immediately be adopted,—the application of a ligature to the femoral artery, or the laying open of the aneurismal swelling, and the application of ligatures to the artery above and below the breach in its coats.

The following considerations show the difficulty of deciding, under such circumstances, as to which operation should be had recourse to. Ligature of the femoral artery would, in all probability, have entirely arrested the hemorrhage for the time, but suppuration of the enormous cavity must have followed, and a free exit must have been given for the pus and coagula which it contained; a free communication would thus have been established between the breach in the artery and the surface of the body, and the collateral circulation must almost of necessity have renewed the bleeding in a few days. The condition, as regarded the risk of hemorrhage, was similar to that of a wounded artery; but with this difference, that the wound communicating with the artery could not be closed, and the slightest current passing through the vessel must have renewed the hemorrhage.

Again, the laying open of the tumour, and the ligature of the artery at the bleeding point, independently of its being a very serious operation under the circumstances, would have been attended by all the danger of the old operation for spontaneous aneurism, the danger of secondary hemorrhage from the application of ligatures to a diseased artery. Mr Guthrie, in one of his *precepts* on the subject of arterial bleeding, says, "When a circumscribed or diffused aneurism, which has formed after a wound, has been opened, whether by accident or design, it is placed in the situation of a wounded artery, and should be treated as such. If the aneurism has arisen from disease of the vessel, and the wound or opening into it cannot be permanently closed, the limb is in a worse state than if the artery had been wounded by accident, because a ligature or ligatures placed on a diseased artery are little likely to be successful. They are liable to all the difficulties and inconveniences attendant on the old operation for aneurism."

Fortunately, as it turned out for the patient, he was not in a condition to bear the shock which would have been produced by amputation of the limb,—a pro-

ceeding which would probably have been adopted, had his exhausted condition not rendered such a measure hopeless.

The old operation was performed; the femoral artery having been compressed by the application of a tourniquet, the aneurismal swelling was laid freely open, and the large cavity cleared of the coagulated blood which distended it; a hard tumour, of the shape and size of an orange, was thus brought into view, within a short distance of the ham, adhering firmly to the surrounding textures. It was easily recognised as the fibrinous mass which had formed within the aneurism, before it had become diffused.

On tearing away this mass of fibrine, the posterior tibial artery was brought into view; and on slackening the tourniquet the blood issued from a small oval-shaped opening on its posterior surface. The opening was abrupt and defined, and did not involve above a third part of the circumference of the artery. The artery was matted together with its accompanying veins and with its sheath, so that it was with difficulty separated, so as to allow of the passage of the aneurism needle. The vessel having been securely tied immediately above and below the opening, the tourniquet was slackened, when I was astonished to find that the blood still issued, although with diminished force, through the opening. On looking for the cause of this, I discovered that the breach in the vessel was close to the origin of the peroneal artery, which opened into the posterior tibial between the ligatures. A third ligature was accordingly placed around the peroneal artery, by which the bleeding was completely arrested.

Some lint was placed in the cavity, and the limb was gently supported by a flannel bandage, applied from the toes to the knee. The patient rallied slowly from his sunk condition, and on the following day the limb had regained its temperature, and was greatly reduced in size. On the thirteenth and fourteenth days after the performance of the operation, the knots of the ligatures were seen in the discharge ;no bleeding occurred, and everything went on well. He was able to be out of bed for some hours every day, in three weeks after the operation; the large cavity in the calf of the leg contracted slowly, and was entirely healed at the end of two months. His health gradually improved, and I found, on inquiring for him six months afterwards, that he had resumed his duties as a letter-carrier, which he still performs, in good health, and walking not less than twenty-five miles a day.

The swelling in the right limb remained stationary for some time after the operation, and then began to diminish in size, and ultimately disappeared. My attention was first directed to its presence by the patient about a fortnight after the operation, when it could be felt as a hard globular tumour beneath the belly of the gastro-cnemius muscle. It had very much the character of a solidified aneurism, and its history rendered it not improbable that the tumour was of a similar character to that which had existed in the opposite limb.

Mr Syme mentions in one of his clinical lectures,[1] a case of false aneurism in the upper part of the leg, which occurred shortly before the case which I have related, and in which the opposite practice was necessarily followed; and as the case illustrates forcibly the danger of a recurrence of the hemorrhage, which is incurred by resorting to the Hunterian operation under such circumstances, I shall quote the case in Mr Syme's words:—

"A middle-aged woman, in a country town, while walking up a steep and slippery ascent, and carrying a knife with which she had just killed a pig, fell, and thrust the sharp point of the blade completely through her leg, a little below the knee, entering between the tibia and fibula, and issuing at the lower part of the popliteal space.

"Blood gushed from both openings, but, when she was laid in bed ceased, and did not return. At the end of a fortnight, the wounds having healed, she attempted to walk, and found that a swelling had taken place at the seat of injury, on account of which, by the advice of her medical attendant, she came here

[1] Monthly Journal of Medical Science. April 1851. P. 371.

to be under my care. On examination, I found a large pulsating tumour in the fore part of the leg, immediately below the knee, and another of equal size in the popliteal cavity.

"Feeling unable to determine whether the anterior or posterior tibial, or the popliteal artery itself was the vessel wounded, and, on the whole, being inclined to think that the one last mentioned was most probably concerned, in which case ligature of the femoral would be the proper course, I adopted this measure. No bad consequence followed the operation, the tumours ceased to pulsate, and favourable expectations were entertained of the result for two or three weeks, when the anterior wound below the knee opened and bled profusely."

The wound was then dilated, the false aneurism cleared of its coagula, and pressure applied on the bleeding point between the tibia and fibula. Mortification followed, and the limb was amputated.

I watched the progress of this case with much interest, as it appeared to me to be one of the few cases in which the ordinary operation of applying ligatures at the wounded point of the vessel, was impracticable. The result, as ascertained on dissection of the limb, proved it, I think, to be so. The wounded vessel was the anterior tibial just before it passed through the inter-osseous ligament, a point which very extensive incisions either in the front or back of the leg, would scarcely have rendered accessible. The uncertainty as to which vessel was wounded, rendered such an operation still further inadmissible. Ligature of the femoral artery seemed the only proceeding which gave the chance of the limb being preserved; but the failure of the operation as regards the bleeding, is an excellent illustration of the necessity of adhering to the established rule, unless the peculiar circumstances of the case render it impracticable to do so.

Secondary Hemorrhage following Amputation of the Leg—Ligature of Anterior Tibial Artery—Recurrence of Secondary Hemorrhage—Ligature of Femoral Artery.

James Moffat, æt. 8, admitted into the Royal Infirmary September 3, 1851. This boy was sent from some distance in the country, for the purpose of having his foot amputated, on account of disease of the tarsus and ankle-joint. The disease had existed for two years, and had been allowed to advance so far that the entire tarsal bones were destroyed, the probe, introduced through numerous sinuses which existed, passing from one side of the foot and ankle to the other, in various directions. The boy was much emaciated, and presented the scars of strumous abscesses on various parts of his body. It seemed doubtful whether amputation through the malleoli would effect the removal of the entire disease; but it was deemed advisable to perform this operation in the first place, and to remove the limb at a higher point, if the state of the tibia and fibula seemed to render it necessary. Chloroform was administered, and a tourniquet applied above the knee, to prevent the loss of any blood, in the event of the higher operation being found necessary. On disarticulating the foot at the ankle, the carious condition of the bones was found to extend for two or three inches above the malleoli, and amputation was immediately performed about five inches below the knee.

The wound healed rapidly, and the ligatures had all separated ten days after the operation. On the fifteenth day following the amputation, about an hour after taking his breakfast, he was suddenly seized, without any previous indisposition, with a convulsion fit of considerable violence and duration. During the convulsion, he struck his stump violently against the bed, which caused it to bleed, to the extent of about an ounce, from a small part of the wound which remained unhealed on the outer side of the stump. Two days afterwards (September 25th) the hemorrhage recurred, to the extent of four or five ounces, whilst the boy was lying quietly in bed. On examining the stump about an hour afterwards, there was no distension, and there seemed no further disposition to bleeding. The stump was dressed as usual, and a piece of lint, wet with cold water, was applied over the bandage. Directions were given, that if the bleed-

ing recurred, the wound was to be firmly plugged with lint. I was absent from Edinburgh on the following day, and on returning on the 27th, I found that smart arterial hemorrhage had occurred two or three times on the previous day, and had been arrested by the wound being firmly plugged, and by the application of a bandage. The bandage was tight, and the stump evidently distended beneath the dressings.

The patient was immediately removed to the operating theatre, and, a tourniquet having been applied to the femoral artery, I removed the dressings, and introducing my finger into the opening on the outer side of the stump, broke up the adhesions of the entire wound. On clearing out the clots with a sponge, and slackening the tourniquet, a forcible jet of arterial blood issued from the situation of the anterior tibial artery. The bleeding point was distinctly exposed, but the artery gave way as often as it was seized by the forceps, and it was evidently necessary to place a ligature upon it at a higher point. In order to expose the vessel above the bleeding point, it was found necessary to disarticulate and remove the head of the fibula. This having been done, the artery was brought into view, where it passed through the inter-osseous ligament, and a ligature was placed around it at this point.

Everything progressed favourably for a few days, but the ligature separated so early as the fifth day after its application, and in five days more copious arterial hemorrhage again took place from the stump. A ligature was now applied to the superficial femoral artery, immediately above the crossing of the sartorius muscle. The hemorrhage was at once arrested, and never recurred. The ligature separated from the femoral artery on the 11th day after the operation, and the small wound in the thigh was entirely healed in a day or two afterwards.

The boy made a slow recovery, which was protracted by the formation of a large superficial abscess on the inner side of the knee, and by exfoliation of small portions of the tibia. Under the careful management, however, of a most attentive and diligent pupil, Mr James Loch, the stump is now quite healed, and a small superficial sore only remains on the inner side of the knee. His health is greatly improved, and he is about to return home.

The failure of the practice, which was adopted in the first instance in this case, was attributable, I think, to the cachectic state of the patient's constitution. Secondary hemorrhage occurred on separation of the ligature, which had been applied to the anterior tibial artery, at a short distance (about an inch) from the bleeding point. It was the practice, nevertheless, which I believe ought to be followed, as a general rule, in secondary hemorrhage from a large vessel after amputation. The application of a ligature on a sound part of the vessel half an inch or an inch above the point where the vessel has given way commands the hemorrhage with much greater certainty than the distant ligature, which leaves the collateral branches free to renew the current in the trunk of the vessel, and thus to renew the hemorrhage, which has occurred through the breach in its coats. Various instances have been recorded in which the distant ligature on the main trunk (as the ligature of the subclavian for secondary hemorrhage after amputation at the shoulder-joint) has proved unsuccessful in permanently arresting the hemorrhage from the stump; and these failures have led to the practice, which, though unsuccessfully adopted in the case I have related, is nevertheless that which should, as a general rule, be followed. In the event of its failure, ligature of the main trunk at a higher point may still be resorted to with as good a prospect of success as in the first instance.

Part Fourth.

PERISCOPE.

HISTOLOGY.

DIRECTIONS FOR MAKING AND PRESERVING MICROSCOPICAL PREPARATIONS. BY HARTING OF UTRECHT.

[The following directions are translated, in a slightly abridged form, from different parts of Harting's work on the microscope.[1] They have been selected as likely to prove useful to that now numerous class of students who prosecute original researches with the aid of the microscope. Personal experience enables us to attest the value of some of these hints; and the fact that Professor Harting's unrivalled cabinet of microscopic preparations, comprising more than 6000 specimens put up with his own hands, is indebted for its completeness and preservation to the methods of manipulation here described, is sufficient evidence of their excellence.—*Trans.*]

Very few objects can be preserved unaltered when dry, and even when this is possible, as in the case of hairs, fish-scales, and the like, the method is not to be in general recommended. Such objects, when surrounded by air, possess too little transparency to permit a satisfactory definition of their component parts. It is only for preserving the scales of insects and certain *test objects* that the dry method is useful, and even preferable, from the superior distinctness with which it enables the observer to make out the different sorts of lines upon these bodies. The simplest mode of mounting these scales for microscopical examination, is to lay a few of them upon an ordinary glass object-slide, which may be moistened with the breath, if this is found necessary to make the objects adhere to it. A glass covering-plate, of suitable thickness, is then laid upon the object; and finally there is pasted round both slide and cover a piece of paper, having in its centre an opening corresponding to the position of the object.

Different specimens from the organic kingdom would, if simply put up in the dry way, speedily become the prey of vegetable and animal parasites. This is the case, for instance, with sections of organs like the lungs, preserved by inflation and subsequent drying. To prevent this disadvantage, I am in the habit of moistening such preparations with oil of turpentine, which, on evaporating, leaves upon the surface a very delicate varnish-like coating, which suffices for its protection.

Most microscopical objects, however, require to be mounted in some fluid, the nature of which must be varied according to the properties of the substance which it is wished to preserve. The fluids which I employ are the following:—

I.—*Saturated Solution of Chloride of Calcium.*

1st, This solution, which must be perfectly free from traces of iron, is of very general utility, and may be employed in all cases in which the substance to be preserved is of moderate firmness or hardness. In this solution all preparations of bones and teeth, sections of hairs, feathers, fish-scales, whalebone, &c., are best preserved. It may be also used with advantage for mounting specimens of many minute animalcules provided with a hard integument, such as cheese-mites, the itch-insect, small fresh-water crustacea, and the like. It is likewise the best preservative for vegetable preparations, whose cell-walls or vessels have

[1] Het Mikroscoop, deszelfs gebruik, geschiedenis en tegenwoordige toestand. Utrecht. 3 vols. 1848-50.

undergone a partial incrustation, and is also very useful for displaying the shells or *loricæ* of the siliceous bacillariæ and diatomaceæ.

In using it, one only requires to lay the object on a slide, and to moisten it with a drop of the solution, taking care, at the same time, to remove the air-bells which may be formed here and there. Two pieces of paper, corresponding to the thickness of the object, are next pasted to the extremities of the slide, and the whole is then covered with a second glass plate of the same size. If it should now be found that too little fluid has been applied to the object, or that part of it has run off, a drop of the solution may be applied to the edge of the slide, and will find its way between the glasses by capillary attraction. A piece of thin paper may be inserted between the glasses, to promote the flow of the fluid towards the preparation, or to rectify the position of the object when it has become displaced.

For attaching the strips of paper to the glass slides in this and other cases, the best material that can be used is starch paste, with which a little arsenious acid is mixed, in order to prevent the formation of a species of mould which is otherwise apt to gather round the preparations.—Vol. ii., p. 347-350.

Of late I have discovered a fault in this mode of mounting preparations. In many which have been preserved in drops of the chloride of calcium solution, there have formed numerous branches of a species of Hygrocrocis, which spread from preparation to preparation, and from box to box, threatening totally to destroy all specimens which have been put up in this way. I have consequently discontinued the practice of mounting specimens in chloride of calcium solution, to which the air still has access; and when I now employ this or any other fluid, am careful to exclude the influence of the atmosphere by touching the edges of the covering-plate with a cement which I have elsewhere described (see p. 376). This procedure has the additional advantage of not requiring the use of a saturated solution: it may be diluted, in proportion to the delicacy of the specimen, with from two to ten parts of water.—Vol. iii., p. 470.

II.—*Canada Balsam.*

Many varieties of this substance are met with in commerce, differing from each other in purity and colour. The best, and which is alone suitable for the use of the microscopist, is perfectly transparent, almost colourless, and very viscid. Canada balsam is used as a preservative material in all cases when it is of importance to heighten the transparency of the object,—as in mounting specimens of pollen grains, sections of hard fruit envelopes, corals, shells, and especially injected preparations of organs which suffer no change from previous drying (see March Number, pp. 245-253). It is also employed for mounting many powder-like mineral substances,—mud, containing diatomaceæ; chalk, with foraminifera, &c. Specimens of this last sort should be spread with water on the object-slide, which should then be warmed till the powder is dry. When cold, the specimen is covered with the balsam, which, if too viscid, may be brought to the consistence of syrup by the addition of a little oil of turpentine. The mixture with water may be dispensed with in the case of most other objects; but it is generally expedient to moisten them first with oil of turpentine, in order to get rid of air-bubbles which may be present, and finally to cover them with the balsam. The pasting and covering of the slides are performed just as when the chloride of calcium solution is used.

III.—*Creozote Solution.*

This fluid may be prepared either by distillation with water, or by filtering a saturated solution of creozote in one part of alcohol of s. g. 867°, after mixing it with twenty parts of water. It is useful for all preparations of muscle, cellular tissue, tendon, ligament, cartilage, sections of bones and teeth which have been treated with acid, the fibres of the crystalline lens, etc. For the preservation of adipose tissue, of the ultimate nerve tubes, and of the blood-corpuscles,

it is not well adapted. Objects put up in it, after a certain time, usually acquire a brownish-yellow tint.

IV.—*Solution of Arsenious Acid.*

To prepare this solution an excess of arsenious acid is boiled with water, which is then filtered and diluted with thrice as much water. This fluid is one of the most suitable preservatives for preparations from the animal kingdom; all the tissues mentioned under the last head, and also the adipose tissue, may be kept unaltered in it; and as they acquire no yellow colour, or a far slighter tinge, during their immersion, I have of late years accorded a general preference to the arsenical over the creozote solution.

V.—*Solution of Corrosive Sublimate.*

This is prepared by dissolving one part of corrosive muriate of mercury in from 200 to 500 parts of water. The strength of the solution must be varied according to the nature of the object to be preserved; hence it is well, when the required degree of concentration is not ascertained, to put up several preparations with solutions of different strengths. This procedure is especially applicable to blood-corpuscles, which can be preserved unaltered in no other fluid with which I have experimented. Thus the blood-corpuscles of the frog require a fluid containing $\frac{1}{400}$th of corrosive muriate; those of birds a solution of $\frac{1}{300}$th; those of mammalia and man $\frac{1}{200}$th.

These solutions are likewise useful for keeping the elementary parts of the brain, spinal cord, and retina, although all these structures, in whatever fluid they are put up, undergo some alteration. Cartilage, and the fibres of the crystalline lens, keep well in these fluids; but other fibrous tissues lose too much of their transparency when in contact with them. They may be used, however, for preserving muscular fibre, whose cross markings they render more distinct.

For preparations of delicate vegetable tissues, and, in general, of all tender organs in which it is desired to retain the starch globules and chlorophyl unaltered, for fresh water algæ, diatomaceæ, confervæ, infusoria belonging to the division rotifera, &c., a solution containing $\frac{1}{400}$th or $\frac{1}{500}$th of corrosive sublimate is the best preservative with which I am acquainted.

VI.—*Solution of Carbonate of Potass.*

This may be made of various strengths, with one part of the salt dissolved in from 200 to 500 parts of water, and is the best material for preserving the primitive nerve tubes. Other fibrous tissues may be kept tolerably well in it, but become more transparent than in the fresh condition. This is sometimes advantageous, as, for example, when we wish to display the respiratory apparatus of insects with the ramifications of the air-tubes.

VII.—*Solution of Arsenite of Potass.*

I have, in a few instances, made use of a solution of arsenite of potass in 160 parts of water, to preserve the primitive nerve-tubes. It has been found as effectual as the carbonate of potass solution.

In employing the chloride of calcium solution[1] and Canada Balsam, it is unnecessary to take measures to prevent the evaporation of the fluid. The first remains always fluid,—chloride of calcium being a deliquescent salt; and as the outer surface of the balsam hardens, the escape of the liquid portion is prevented.

But it is otherwise with the last-mentioned preservative fluids (Nos. III. to VII.) To prevent their evaporation, it is necessary to employ a cement or luting to prevent air from having access to the fluid. Different compositions

[1] The author has renounced the practice of putting up preparations in this fluid, and permitting the access of air, for reasons given at p. 374, line 16, et seq.—[Trans.]

have been recommended for this purpose; but I have found none more serviceable than that employed by gilders to make gold-leaf adhere to mirror and picture frames. The following is the receipt for the preparation of this so-called gold-ground or gold-size:—

Let twenty-five parts of linseed oil be boiled for three hours with one part of red lead (*menie*) and one-third of a part of umber, and then poured off. Next take white lead and yellow ochre, well pounded and divided, and mix them together in equal proportions. Successive portions of this mixture must be added to the oil, and well rubbed up and mixed with it, till a tolerably thick fluid is formed, which must be once more thoroughly boiled.

If now a preparation has been made, which it is wished to preserve in the chloride of calcium, or any of the five last-mentioned fluids, and if it can, without injury, bear a little pressure, the following manipulation is recommended:—

If the specimen is moistened with water, which during the preliminary examination is frequently the case, all superfluous fluid is in the first place removed with a little roll of bibulous paper, or with a camel-hair pencil, such as I have elsewhere recommended. The fluid at a little distance from the object may be wiped off with a cotton or linen rag, and the surface of the glass there made perfectly dry. A certain quantity of the preservative fluid is then placed upon the specimen, and this is most conveniently effected by using a dropping-flask. The amount of fluid should be such that it should afterwards perfectly fill the space beneath the covering plate; the proper quantity is soon learned by a few trials. Next a (square?) covering-plate, about two millimetres ($\frac{1}{12}$th of an inch) narrower than the object-slide, should be laid under the centre of the latter,—*i.e.*, immediately beneath the part which it is destined to cover. A pencil is next dipped in the cement, and a square drawn with it upon the glass around the fluid containing the specimen, so that the cement shall extend from one to two millimetres ($\frac{1}{25}$th to $\frac{1}{12}$th of an inch) within the margins of the covering-plate. The latter is now to be placed upon the specimen, and its margins finally covered with the cement. If there is too much fluid beneath, the superfluity finds a channel for escape; an opening then takes place in the cement, below the cover, but is again closed, if care be taken to renew the application of the cement to the edges of the cover, when the superfluous fluid has been removed, or has dried up. In about two days, the outer layer of the luting will have become dry, but the inner layer remains soft for many weeks and even months. This is just what constitutes the excellence of the cement, for it never bursts and permits evaporation; and a great number of preparations which I have put up in this manner are at the present time, after the lapse of several years, quite unaltered. It is, however, of importance that the cement shall occupy a portion of the space between the object-plate and its cover; a mere anointing of the edges of the latter is never sufficient.

If the specimen be one which will not bear pressure without injury, it must be put up in some kind of cell, the depth of which must be regulated by the thickness of the object. The covering-plate must in this case be always smaller in diameter than the space between the outer margins of the cell. First, some preservative solution is placed in the cell, and then the object is laid in it; the upper edges of the cell are then touched with a little of the *gutta-percha luting*.[1] The cell is then completely filled till the fluid even forms a convexity above its margins; if now the cover is applied, the superfluous moisture escapes, and no air remains in the cell. Finally, when the edges are dry, they must be covered with a thick layer of the luting, and with a second a few days afterwards.

The method last described is especially applicable to the preservation of injected specimens in a solution of arsenious acid.—Vol. ii. p. 350-355.

[1] The reader will find the receipt for this composition, and directions for making cells of gutta-percha and caoutchouc, at the end of the present article.—[Trans.]

Preparation of Caoutchouc Cells.

In commerce we now obtain caoutchouc plates of different thicknesses. The thinnest measure about one millimetre ($\frac{1}{25}$th of an inch), and out of these plates of any required thickness may be formed, as their surfaces adhere perfectly together, especially if previously slightly heated. In a square piece of suitable thickness an opening may be made by means of a scissors, or the centre may be cut out of a disc-shaped piece by means of a hammer and ring-shaped punch. To fasten the caoutchouc ring to the object-slide we use the following luting :—

One part of finely cut gutta-percha is mixed with fifteen parts of oil of turpentine, and dissolved in it by gently heating, and constantly stirring, the mixture. The solution is then poured through a cloth, to separate some impurities which are always to be met with in raw gutta-percha. To the purified solution there is added one part of shell lac, which, by the aid of gentle heat and constant stirring, must be dissolved in it. The heat is then kept up until a drop of the solution let fall upon a cold surface becomes nearly hard. The cement is then ready for use. If it is afterwards found requisite to melt it again, a little oil of turpentine should be added before applying the heat.

To attach the caoutchouc ring to the glass, proceed as follows:—Lay the ring upon the table, and above it place the glass object-slide, so that the ring occupies the centre of the slide, and a free margin of glass is left around it. A pencil is now to be dipped in the warm luting, and carried over the portion of the glass through which the ring is seen, care being taken to spread the luting in a thin layer, as the superfluous fluid would otherwise flow out from the edges. The ring is now removed from beneath the slide, and laid upon the spot marked out for it with the cement. The plate is next warmed by holding it over fire, and then laid, ring downwards, on a cold piece of mirror glass till the cement has become cool and hard.

Gutta-Percha Cells.

Gutta-percha, which, like caoutchouc, resists the action of almost all chemical agents, has, besides, the property of becoming soft and plastic in warm water, and can thus be fashioned into any required shape, which it retains on cooling and resuming its former consistence. Gutta-percha sheeting may be procured in commerce, like caoutchouc sheeting, of any thickness, and will be found very useful for microscopical purposes. Plates of this substance may be provided of various thicknesses, according to the required depth of the cells,—for example, from $\frac{1}{10}$th of a millimetre to three millimetres ($\frac{1}{250}$th to $\frac{1}{8}$th of an inch) in thickness. These plates must then be cut into square pieces, a little narrower than the glass slides on which they are to be fastened. The openings may be cut out with a scissors, or struck out with a punch and hammer, the plate being laid upon a piece of cork. To fasten gutta-percha rings to the glass plates the cement recommended for caoutchouc is employed, and the process conducted in the same way, with this difference, that, after the last heating, which makes the gutta-percha soft again, pressure should be made upon it for a few seconds with a cold piece of mirror glass. The upper surface of the cell is thus rendered quite flat and smooth, so that the glass cover, when applied, is everywhere in contact with it. In this respect the gutta-percha cells are preferable to those of caoutchouc, the upper surface of which, especially about the edges, has always some degree of convexity.—Vol. ii., pp. 125-127.

MEDICINE.

HYDRASTIS CANADENSIS IN GONORRHŒA.

Dr MacCann, of Ohio, has used this in several cases in various stages of the disorder, and in every case with the most satisfactory results, more especially with males than females. He was led to its use by noticing its well-known

sanative properties over inflammations of mucous and epithelial structures, such as aphthæ of the mouth, etc. The ardor urinæ, and the discharge of mucus, has been entirely suspended in every case in from twenty-four to seventy-two hours. In some cases he used the balsam of copaiba; in others, injections of infusion of the hydrastis alone, but without the same results—a perfect and permanent eradication of the disorder. He varied the strength to suit the case in its different stages; but, as a general rule, he has used about one drachm of the dried root to the pint of infusion, injecting a syringe-full three or four times a-day.—*Dublin Medical Press.*

CASE IN WHICH THE TRICHINA SPIRALIS EXISTED IN VERY LARGE NUMBER IN THE VOLUNTARY MUSCLES. BY O'B. BELLINGHAM, M.D., F.R.C.S.

Bernard Macauley, æt. 67, a labourer, admitted into St Vincent's Hospital, December 20, 1851. He had for several years suffered from cough and oppression of his breathing. A fortnight ago he states that he was attacked with severe pain in the left side after exposure to cold. On examination, signs of bronchitis and emphysema of the lungs were evident; in addition, there was dulness over the base of the left lung posteriorly, but not the degree of dulness which indicated much fluid. The breathing was much oppressed, and the patient much debilitated. He gradually became worse, and died on the fifth day after his admission. On examination, the lungs were emphysematous, the bronchial tubes loaded with mucus, the left pleura was coated with lymph, and about a pint and a half of very fœtid pus was contained in its cavity.

The most remarkable point, however, connected with the case, was the presence of an immense number of the cysts of the trichina spiralis in the voluntary muscles, particularly in the pectoralis major and minor upon each side, in the sterno-mastoid, sterno-hyoid, sterno-thyroid, and omo-hyoid muscles upon both sides.

When these muscles were exposed, they had the appearance of being dotted over with innumerable minute white specks, of an oval or elliptic form, the long diameter corresponding with that of the muscular fibres. These, on examination, proved to be cysts of the trichina spiralis; the cysts were tough, and a single entozoon was coiled up in each. In one instance a cyst contained two of these animals.

This entozoon was described in the year 1835 by Professor Owen, in the "Zoological Transactions," under the name "Trichina Spiralis." Subsequently it was very fully examined by Dr Arthur Farre. Mr Owen places it in the class Protelmintha, in which it is associated with the spermatozoa and fibrionidæ.

The cyst which encloses the animal is, according to Dr Farre, double, and he has frequently found two individuals in the same cyst. The entozoon itself is about the thirtieth of an inch in length, and, as the magnified drawings show, it has a cylindrical form, and is of a greater diameter at one extremity than the other. Dr Farre describes an alimentary canal with an orifice at the larger extremity, and an indication of one at the smaller; the latter Mr Owen regards as the anus. The usual seat of the cysts containing the entozoa is in the voluntary muscles. Dr Farre[1] says:—"The superficial muscles contain them in far greater numbers than the deeper seated, especially the broad flat muscles, as the pectoralis major and the latissimus dorsi." In a case which he relates, they were present in greater or less numbers "in all the muscles of the trunk and extremities; in those of the eye and external ear, in the tongue and soft palate, the constrictors of the pharynx and œsophagus, both the crura and radiated portion of the diaphragm, in the levator and external sphincter ani, and the muscles of the urethra. The only muscular structures which seemed to be free from them, were the heart and muscular envelope of the stomach, intestines, and bladder, together with one or two other exceptions." In the present case, these entozoa were not found in either the diaphragm or heart; but they existed in very large numbers in the superficial muscles of the chest and neck.

[1] Medical Gazette, December 1835.

The presence of these entozoa in the muscles does not appear to have any injurious influence upon the individual who is the subject of them, or to cause any alterations in the muscles themselves. In the subject of this case, the muscles which contained them were remarkably well developed, and had otherwise a very healthy appearance. Their occurrence in the system Mr Owen states to be unconnected with either age, sex, or any particular disease. They were met with by Mr Curling[1] in the muscles of a healthy man, whose death was the result of an accident; and they have been found in subjects dying of the most opposite forms of disease.—*Dublin Medical Press.*

ON A PECULIAR APPEARANCE OF THE TONGUE FOLLOWING THE PROLONGED USE OF IODINE.

Professor Langston Parker records the following cases :—

(I.) A surgeon, aged 47, consulted me in the early part of this year for certain symptoms of an old venereal taint. He had taken ten grains of the iodide of potass twice or thrice a day for ten years. There was no wasting of the testes. He had sarcocele, clearly venereal, with a small hydrocele on one side; the testis on the one side was healthy. There was hypertrophy of the tongue, which was tender, and covered with lobes or nodes, and fissured by deep cracks.

(II.) A German gentleman, who had suffered from secondary syphilis for five years, and who had been treated by Ricord, Chelius, and others, was sent to me for an opinion, as to the nature of a disease in his tongue. He had taken large quantities of iodide of potass for four years. The tongue was tender, swollen, lobulated, and fissured by deep cracks. The testes were of good size, and appeared healthy.

(III.) Patient had taken five grains of the iodide of potassium three times daily for nearly three years. He was emaciated and weak, and his appetite was totally gone. He presented no symptoms of venereal taint, attributing his indisposition to the prolonged use of the remedy. The testicles were healthy, and of full size. The tongue was similarly affected.

(IV.) A gentleman had suffered from a constitutional venereal taint for thirteen years. He had taken large quantities of the iodide of potass for long periods. The tongue presented the appearance already described. It was in some places hard and lobulated, in others fissured by deep cracks. The left testis had almost entirely disappeared; it was reduced to the size of a pea. The right was of full size, and healthy. Virility was not impaired.

Professor Parker has selected these cases from a mass of others establishing the same conclusions. The peculiar, almost cancerous, appearance of the tongue, he believes to be due to the long-continued use of the iodide of potass. The fourth case is the only one in which he ever saw the absorption of the testicle directly the consequence of the same cause.—*Provincial Medical and Surgical Journal.*

ON THE DISTINCTION BETWEEN THE CONSECUTIVE FEVER AND THE SECONDARY FEVER OF CHOLERA. BY DR STRATTON, R.N.

After a patient has struggled through the severe stage of cholera-proper, and obtains a respite from the great purging, vomiting, spasms, and unnatural coldness, he in some cases merely remains debilitated and weak, and suffers a little perhaps from salivation, or some other effect and sequel of the remedies that have been employed, but at other times he passes into one of four states :—

1. Drowsiness and tendency to coma, with diminution or suppression of urine.
2. A feverish state, with chest symptoms.
3. A feverish state, with abdominal symptoms.
4. A combination of any two, or of all three, of the above.

In some works the name, consecutive fever, is applied to all the four varieties; and in a few other publications, secondary fever is the term used for all. I con-

[1] Medical Gazette, February 1836.

sider that the first set of symptoms are of vastly superior importance and danger to the others, and that it is far better to give different names to symptoms so very different in their nature, cause, and importance, and in the kind of treatment they require. I would therefore restrict the term, consecutive fever, to those cases where we have the following diagnostic symptoms after cholera:—A feverish state, drowsiness, and a tendency to coma,—the secretion of urine being scanty, or suppressed. The cause of the consecutive fever is the retention in the blood of the urea, which remains, and acts as a poison on the brain, instead of passing off by the kidneys. The treatment is, of course, by those means which may be expected to stimulate or revive the lagging or dormant energies of the kidneys.

Secondary Fever of Cholera.—This term may, with great practical advantage, be confined to cases where, after cholera, there are febrile symptoms, with either (1.) signs of irritation or congestion of the lungs, palpitation of heart, &c.; or (2.) irritation or slight inflammation of the intestinal mucous membrane; or (3.) a combination of these. Any instances of the above, with also drowsiness and deficient urine, ought to be placed under the more important head of consecutive fever. Instances where, in addition to chest or abdominal symptoms, there is also a somewhat lessened secretion of urine, need not be placed under consecutive fever, unless there is also a tendency to drowsiness.

As to the nature and cause of secondary fever—in the lungs, in some cases, there is a slight obstruction to the easy circulation of the blood, from the circumstance of its having become thicker in consequence of having lost so much of its thinner part by the serous diarrhœa. In the alimentary canal some irritation must often have arisen, from the variety and quantity of the medicines administered. Sometimes, towards the termination of a cholera case, dysenteric symptoms appear for a day or two, but these it does not appear to be necessary to class under the head of secondary fever.—(*Letter to Sir William Burnett, Director-General of the Navy*—in *Edinburgh Medical and Surgical Journal.*)

ON THE CURATIVE TREATMENT OF ANEURISM OF THE AORTA. BY O'B. BELLINGHAM, M.D.

At the meeting of the Surgical Society of Ireland, held on the 24th January, Dr Bellingham read a most important paper on this subject, and illustrated his observations by cases. The following are the conclusions which the author deduced:—

1st, That aneurism of the aorta is not necessarily an incurable disease.

2d, That it appears to be more amenable to curative treatment than is ordinarily supposed.

3d, That treatment ought always to be specially directed to this object.

4th, That when a spontaneous cure occurs, it is always by the gradual disposition of the fibrine of the blood in layers within the aneurismal sac, until it is filled up.

5th, That if we hope to succeed in effecting a cure, it must be by imitating the mode by which nature brings this about.

6th, That, in order to favour the gradual deposition of fibrine, we should aim at diminishing the mass of blood, and lessening the strength and rapidity of the current through the aneurismal sac.

7th, That this can only be indirectly accomplished by acting on the general circulation.

8th, That neither bleeding, purgatives, diuretics, digitalis, nor the various other remedies which have been employed in this disease, can be depended upon for producing these effects.

9th, That an extremely restricted diet, particularly in fluids, continued for a certain time, appears to have the effect of rendering the pulse small, compressible, and slow, and, at the same time, of diminishing the mass of blood.

10th, That the cases related afford evidence that these results may be brought about by treatment conducted on the foregoing plan.

11th, That this method of treatment, to prove effectual, must be steadily and perseveringly carried out, and must be continued until a decided impression is made upon the disease.

12th, That it is adapted, not only to aneurism of the thoracic and abdominal aorta, but to aneurism in any of the immediate branches of these vessels; and that if employed as a preliminary to compression, pain will be diminished, and the duration of the treatment considerably abridged.—*Dublin Medical Press.*

REVIVAL OF AN OLD REMEDY FOR ASTHMA. BY M. AL. FAVROT.

Take a strong solution of nitre; steep some amadou (German tinder) in it; then dry it.

Next procure a flask with a wide mouth, and fit to it a cork, pierced to receive a piece of tube. A tobacco-pipe (the extremity of which can be closed at pleasure) will suffice.

Light the amadou, and place it in the flask. Then let the patient inspire, either by the mouth or nose, the gases disengaged. After the lapse of a few minutes he will begin to experience some progressive alleviation of his dyspnœa. —*Abeille Medicale*, quoted in *Revue Méd.-Chirurgicale de Paris*, February 1852, p. 97.

[There is nothing new under the sun. The burning of match-paper under the nose of an asthmatic patient, is an old remedy, once popular in this country.]

COMBINATION OF COLLODION AND CASTOR-OIL USED IN CASES OF ERYSIPELAS. BY M. GUERSANT.

M. Guersant has recently employed with advantage, in a severe case of erysipelas, an application to the skin, consisting of collodion in combination with castor-oil. The formula was—collodion, 30 parts; castor-oil, 2 parts, mix. This varnish was applied once on each of three successive days to the parts attacked by the exanthema, and caused the cessation of the burning pain, and the disappearance of the dark redness of the surface; the general symptoms seemed, at the same time, to be alleviated by some favourable influence, and the boy who was the subject of experiment became convalescent much sooner than had been expected.

It is to M. Robert Latour that the idea of mixing the collodion with castor-oil is due; but his formula is not the same as that employed by M. Guersant. To avoid the inconvenience of the splitting and scaling off of the collodion, and to prevent its exercising upon the inflamed parts a degree of pressure which some persons would find to be intolerable, M. Latour has proposed to add to the ordinary collodion a fifteenth part by weight of turpentine deprived of its volatile principle by evaporation, and five or six drops of castor-oil to every thirty grammes (463 grs.) We have not seen this kind of collodion used; but as for that of M. Guersant, we are informed by himself that it forms a very soft covering, far superior in point of elasticity to ordinary collodion. It is, besides, more easily detached, and a simple poultice suffices to remove it in pieces, without causing the slightest pain to the patient. The castor-oil is preferable to other oils, being more unctuous, and having less of drying quality.—*Journal de Médecine et de Chirurgie Pratiques,* February 1852, pp. 70, 17.

SALINE INJECTIONS FOR THE CURE OF DRUNKENNESS.

L'Abeille Médicale has lately published a note by Dr Lalaux, on the efficacy of injections of solution of culinary salt in rapidly dissipating the most serious symptoms of intoxication. M. Lalaux's enema consists of two good tablespoonfuls of salt dissolved in four glasses of warm water. It causes a formidable shock (débâcle), after which all the functions resume their play. This remedy has the advantage over ether and ammonia, of being always at hand; and in a case of drunkenness, we had lately occasion to observe that it is more

powerful than ammonia, in causing the cessation of the coma which succeeds intoxication by alcohol.—*Journal de Médecine et de Chirurgie Pratiques*, Feb. 1852. P. 63.

[Salt and water was, in the olden time, poured down the throats of the *Philisters* who would not get drunk. It is a merciful retribution which now awards to their persecutors, their own remedy in a less unpalatable form. We should be glad to have the reports of police surgeons upon its efficacy.]

Part Fifth.

MEDICAL NEWS.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

MEETING III.—*Wednesday, February 4th*, 1852.—Dr BEGBIE, President, in the Chair.

Dr Seller read a paper "On the Indications of Apoplectic Death in Persons found Dead, with Notice of a Case." (This appeared among the Original Communications in our Number for March 1852.)

Dr W. T. Gairdner made some remarks on Dr Seller's paper, and *Dr Seller* replied.

Dr Alexander Wood read a "Case of Poisoning by Oxalic Acid." (This also appeared among the Original Communications in our Number for March 1852.)

A report was read from the Committee appointed to consider the subject of Registration of Deaths. After some conversation, it was agreed to remit the subject for consideration to next meeting.

Dr Seller and *Dr Maclagan* laid on the table a motion approving of the report, and intended to carry out its recommendations, which it was understood would be also considered at next meeting.

Report to the Medico-Chirurgical Society of Edinburgh, by the Committee on Registration of Deaths, appointed January 12th, 1852. (*Members of Committee:—Dr Begbie, Dr Alison, Dr Christison, Dr W. Robertson, and Dr W. T. Gairdner.*)

The Committee of the Medico-Chirurgical Society appointed to consider the subject of the Registration of Deaths, with a view to proposing a scheme for the voluntary registration of mortality by duly qualified medical men in Edinburgh, beg to report as follows:—

The Committee consider the object in question as a most desirable one, and well worthy of the support of the Members of the Society. They also approve generally of the principle maintained in Dr W. T. Gairdner's paper on Registration of Deaths, viz., that medical men should be allowed to state as many of the morbid phenomena in each case as may appear necessary to explain the event, and that all the phenomena so stated should be separately registered. The registration of individual cases would thus comprise a synopsis of their leading features, in so far as these could be ascertained to have been involved in the fatal

event; and the collation of these multiplied details could not fail to prove of advantage to pathological science in many ways, besides accomplishing more perfectly the objects commonly aimed at in registration. The Committee likewise approve of that part of Dr Gairdner's scheme, which proposes that the general type of disease, and the function or part affected, should be registered, *in addition* to the special forms of disease, in order that there may exist formulæ for the reception of guaranteed information, too vague or scanty for registration in any other manner. These principles being recognised, the Committee are of opinion that the details of the statistical nosology, and the technical nomenclature adopted, may be advantageously left to be originated by those to whom the Society may intrust the practical working of the scheme; and further, that any nosological table adopted should be left open to the corrections, additions, or omissions, dictated by more mature experience.

For the superintendence of details, the Committee recommend the appointment, from among the members of the Society, of from four to six honorary Registrars, whose duty it shall be to receive as full information as possible in cases of death, from the medical practitioners concerned in the case; to arrange with them all matters of nomenclature as regards the individual case; and to register it according to the arrangement of the nosological table. They likewise recommend, that the Registrars shall be elected annually, and (together with such additional members as the Society may see fit to appoint) shall form a permanent Committee of Registration, to which all matters of detail, and all suggestions from individual medical men as to the general arrangements, shall be referred, and which shall be expected to present, from time to time, a report of its proceedings to the Society. To assist the Registrars in their operations, the Committee recommend that the Society shall, if necessary, engage the services of a clerk, to keep the General Register, and make the entries in it, according to the instructions of the Registrars; and, with a view to rendering the General Register accessible for scientific purposes, the Committee recommend that the College of Physicians be requested to allow it to lie in one of the rooms at the College Hall, where it may be consulted at stated hours by members of the Medico-Chirurgical Society, or others having an order from one of the Registrars.

If these preliminaries can be satisfactorily arranged, the Committee recommend that a circular should be prepared, and addressed to all qualified medical practitioners in Edinburgh and Leith, requesting their co-operation and assistance in the Society's scheme of registration, in the following terms:—1*st*, That they shall engage to give notice to one of the Registrars, within as short a period as possible after every death occurring in their practice. 2*d*, That they shall thereafter give every information in their power, which may appear to the Registrars to be requisite; filling up any schedule which may be sent to them; and, if it shall appear to be necessary, communicating personally with the Registrar, for the purpose of explanation. The names of practitioners who return a favourable answer to this request should then be entered in a list, to be reported to the Society at the end of each quarter, and to be subject to revision at these or other stated and convenient periods.

The Committee further recommend, that immediate steps should be taken for the formation of a permanent Registration Committee, with a view, if possible, to bring a scheme of Registration into operation at the commencement of the second quarter of 1852. In order to meet the expenses necessary for this purpose, the Committee suggest that a donation of L.20 from the funds of the Society shall be placed at the disposal of the permanent Committee, to be applied as they shall see fit in furtherance of the objects for which they are appointed. Finally, your Committee beg to state, that they have taken into consideration other details connected with this subject; that they are satisfied of the practicability, under proper superintendence, of the plan they have now submitted to the Society; and that if the Society shall see fit to accede to it, and to constitute the more permanent body alluded to, they will consider their present functions to terminate with the delivery of this Report.

THE "DUBLIN MEDICAL PRESS" ON THE REST OF THE MEDICAL PRESS.

The following racy morceau we extract from the "Dublin Medical Press" of March 17, 1852, p. 174 :—

"In England the happy state of ignorance which prevails regarding the labours of contemporaries, notwithstanding the journalistic opportunities of the medical population, we often find to our amusement displayed in many of their 'communications;' and this even more in the metropolis than in the provinces. In France it is much the same, but there the slight acquaintance with English and German possessed by the medical million must be accepted as an excuse; while in Scotland the free-and-easy appropriation of other men's intellectual products must be attributed to a praiseworthy economy which forbids expenditure on book furniture. We would not for the world insinuate that the ignorance we speak of is in any case wilful, or lightly assumed to establish a character for originality; we only mention the matter *en passant*. There is, we admit, very often an astounding display of erudition in the shape of reference to authorities, but it is generally to Germans without surnames, title, or local habitation; or perhaps without any name at all, except some unpronouncable monosyllable. Our 'authors' seem to be hand-and-glove with all of their own craft the world over, except those next door. In London we find many amiable exceptions, for there we find honest fellows who ignore everything beyond the sound of Bow-bells, and even rejoice to avow their ignorance of all things outside their own bounds."

[We need only add, by way of commentary on this characteristic effusion, that the very next number of the "Dublin Medical Press" consisted of thirty-two columns, whereof twenty-three and a half were either advertisements, or extracts from journals in the English tongue, including a liberal selection from our own pages. Strictures on the want of originality displayed in modern medical journalism could hardly proceed from a better source.]

PUBLICATONS RECEIVED.

The Stomach and its Difficulties. By Sir James Eyre, M.D. Lond. Churchill. 1852.

Lateral Curvature of the Spine: Its Causes, Nature, and Treatment. By R. W. Tamplin, F.R.C.S.E. London. Churchill. 1852.

Researches into the Pathology and Treatment of Deformities in the Human Body. By John Bishop, F.R.S. London. Highley and Son. 1852.

Treatise on the Diseases of the Chest. By John A. Smith, M.D. New York. Appleton & Co. 1852.

Sketches of Brazil, including New Views on Tropical and European Fever. By Robert Dundas, M.D. London. Churchill. 1852.

Letter to Sir George Grey on Medical Registration. By Emeritus. Second Edition. London, 1852.

On the Use of Galvanism in Obstetric Practice. By John Hyde Houghton, M.R.C.S.L. Reprinted from the Dublin Quarterly Journal of Medical Science. Dublin. Hodges & Smith. 1852.

On the Fallacies of Homœopathy. By C. H. F. Routh, M.D., &c. Lond. Lewis. 1852.

Lecture on Temperaments, and their Proper Diet. By Dr Merei. Manchester. Bradshaw & Blacklock. 1852.

On True and False Spermatorrhœa. By Dr Pickford, of Heidelberg. Edited by Chirurgus. London. Churton. 1852.

Registrar-General: Report on the Mortality of Cholera in England, 1848-49. London. 1852.

Some Remarks on Constipation. By James Turnbull, M.D. From Provincial Medical and Surgical Journal. Worcester. 1852.

Asylums for the Insane: Observations. By T. Dickson, L.R.C.S.E. Lond. Churchill. 1852.

Verhandlungen der Physicalische Medicinischen Gesellschaft zu Wurzburg. (We beg to thank the Editor for a parcel containing all the back Numbers formerly wanting.)

Life of Dr John Reid. By George Wilson, M.D. Sutherland & Knox. Edinburgh. 1852.

Varicose Veins and Varicose Ulcers. By Thomas William Nunn. London. Renshaw. 1852.

ERRATA IN MARCH NO.

Page 231, in foot note, line 4 from foot, *for* "specimens *stained*," *read* "specimens *obtained*."

Page 251, line 31 from foot, *for* "neutral chromate of *potass*," *read* "neutral chromate of *lead*."

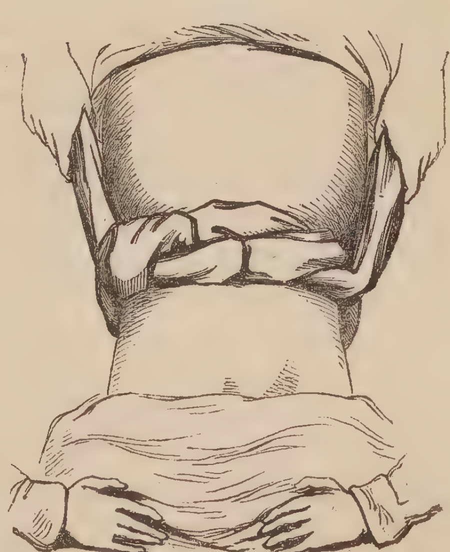
Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*New Mode of Reducing Strangulated Hernia.* By THOMAS A. WISE, M.D., late Surgeon H.E.I.C. Service.

(Communicated through Professor Syme.)

THE following are the particulars I promised to send you, regarding a new method of reducing strangulated hernia. While I had charge of an hospital in India, an elderly man was brought to it with a strangulated inguinal hernia. After in vain employing the usual means of reduction, I was preparing to liberate the gut with the knife, when a Mussulman gentleman suggested, that the following method should be first tried, as he had seen it successful. As it appeared most simple and effective, I at once proceeded to try it. The patient was placed upon a table, and a long sheet, folded several times on itself, was carried round the lower part of the abdomen of the patient, was twisted on itself in front, and again on the sides, so as to enable an assistant, standing on each side of the patient, to hold the extremities of the sheet, and to pull them gently upwards, or towards the patient's head, while a third assistant held the feet steady, and the surgeon used the taxis.



As the gut immediately above thes trangulated portion was superficial and distended with air and liquid, it was drawn upwards with considerable force from the hernial sac, which was assisted by the surgeon using the taxis; when the strangulated portion was immediately reduced.

This simple method may, in a very large proportion of cases,

be employed with perfect safety and at an early period, before inflammation and thickening has complicated and increased so much the danger of the operation, which is thus rendered unnecessary.

ARTICLE II. — *On the Organs in which Lead accumulates in the Horse, in Cases of Slow Poisoning by that Metal.* By Dr GEORGE WILSON, F.R.S.E., Lecturer on Chemistry, Edinburgh.

(*Read to the Royal Society of Edinburgh, March* 1*st*, 1852.)

THE destruction of animal life, which yearly results from the mismanagement of chemical works, in rural places, is probably greater than is generally imagined. Within the short space of five months last year, I had occasion to make a series of analyses in connection with the death of thirteen horses, which, besides several cows, were believed to have been poisoned by compounds of lead, transferred by the atmosphere or by water to the fields in which they pastured. How far the conclusion was just, which imputed the death of all those animals to lead-poisoning, I cannot pretend to decide, as analyses were made in connection only with some of the cases; but as I found that the herbage which the animals ate was notably impregnated with carbonate of lead, it is highly probable that all the deaths were occasioned by this poison. Such, moreover, appears to have been the opinion of those who had the greatest pecuniary interest in holding an opposite view; for the proprietors of the lead-works, after some little delay, declined going into a court of law, and compensated the owners of the deceased horses.

Eleven of the cases in question occurred in Derbyshire, and two in Westmoreland. The special object of the present paper is to state the results of the analyses made in connection with the cases in Westmoreland. They were brought under my notice by Mr Mayor of Penrith, an intelligent veterinary surgeon, who had charge of the animals. From him I learn that the horses—a brood mare and a pony—had pastured in a field adjoining the Greenside Lead Mine, which is situated near Patterdale, among the hills surrounding the head of Ullswater Lake. A stream, proceeding from the mine, and employed in washing the lead-ore, ran through this field, at which the horses were in the custom of drinking. They were thus exposed to the action of lead contained in the water they drank; and I ascertained, by examination of a portion of the water taken from the stream on one of the days when it was employed in washing the ore, that on such occasions it contained a large amount of carbonate of lead, chiefly in the form of a sediment, but also to some extent suspended in the liquid. This, however, was not the only source whence lead entered the bodies of the animals. During the occurrence of a heavy winter flood, the stream referred to was allowed, through some negligence, to burst its barriers, and suddenly over-

flowed the fields in the neighbourhood, which, in the words of Mr Mayor, "were literally covered with a thick coat of the *scum from the mines*, so that persons were set to work (by the company as was understood) to scrape off the grass the sediment which had been left by the water." I obtained a portion of grass and soil from the field here referred to, some months after it had been flooded in the way mentioned. The blades and roots were examined separately, and both were found to yield a large amount of lead (which probably existed in them in the state of carbonate) to diluted nitric and acetic acid. Beans grown in the soil which was sent along with the grass, were found, after incineration, to yield lead to the appropriate reagents and tests. Those facts were ascertained after the analysis of the organs of the poisoned animals; but I mention them first, to show that it was not matter of surmise, but of certainty, that for six weeks or more the pony and mare were daily swallowing small quantities of carbonate of lead in their food and drink.

At the end of the period in question, the horses had become so much emaciated, and otherwise out of condition, that they were removed to a field at some miles' distance, free from impregnation with lead. Without entering into any details concerning symptoms which are unsuitable for discussion here, I may mention, that they survived the change a fortnight, and died rather suddenly at the end of that period, within a short time of each other. I received the stomach and cœcum of the pony, including their contents. No lead was found in the latter, but the substance of the viscera yielded the metal in small but manifest quantity. It is to the examination, however, of the organs of the mare that I wish particularly to refer. It had been buried before I was consulted regarding it, but at my request it was disinterred, and portions of various of the viscera were sent me, and subjected to analysis. As an opportunity does not often occur of making such analyses, in the case of a large graminivorous animal like the horse, whilst the legal questions at issue required a searching examination, I resolved, although it was not a very pleasant inquiry, to analyse each organ separately, in the hope that the results procured, apart from their bearing on the question of pecuniary damages, might prove of some small value to physiologists and medical jurists. With this object in view, Mr Stevenson Macadam, at my request, was associated with me, and took a great deal of care and trouble, especially in carrying the analyses through their earlier and more troublesome stages. The organs we received and analysed were,—1. A part of the lungs; 2. A part of the heart (the cavities of which had been opened); 3. A part of the large intestines and contents; 4. A part of the stomach and duodenum; 5. The spleen, or a part; 6. One kidney; 7. A portion of the liver. It was impossible, with so large a mass of carrion, to attempt drying it in warm summer weather, so as to prepare it for being charred. It became a question, therefore, what reagent was most likely to prove serviceable in facilitating the re-

duction of the animal matter to charcoal. Sulphuric acid was doubly inapplicable as an auxiliary in effecting incineration, from the difficulty of obtaining it in any quantity free from lead, and from the insolubility of the sulphate, which it would produce by its action on the lead it might encounter in the tissues. Hydrochloric acid and chlorate of potass, which the German chemists recommend when metallic poisons are to be sought for in animal tissues, I had tried in some of the analyses of the Derbyshire cases; but the amount of saline residue left was so great, that I gave up this method. In analysing the organs of the pony, nitric acid was employed to dissolve and disintegrate the stomach and cœcum before charring, but it acted too slowly to seem suitable for the purpose on the large scale. I resolved in this case to make use of aqua regia, which Gualtier de Claubry was the first, I believe, to employ in seeking for metals in organic tissues. I found it more than answer my expectations, and would suggest its use in cases like that I am recording. There are four respects in which aqua regia is superior to the other reagents employed to decompose organic tissues in the course of such analyses in cases of slow poisoning. (1.) Its action is much more rapid than that of nitric or sulphuric acid, in consequence of its combining the decomposing influence of several powerful reagents, especially of nitrous acid and chlorine. (2.) The chlorine which it liberates destroys the offensive odorous emanations which form so disagreeable an accompaniment of such an inquiry as the one under notice. (3.) There is no accumulation of saline matter, as in the chlorate of potass and hydrochloric acid process. (4.) Aqua regia does not dissolve the fat of the tissues, whilst it dissolves everything else, and thus it diminishes the amount of animal matter which must be subsequently subjected to the troublesome process of charring. It is not probable that poisonous metallic salts accumulate in the fat, but it is easy, by passing the aqua regia solution, after dilution, through a calico filter, to retain the fat, char it separately, and examine it for poison. The examination of a fatty organ like the liver is greatly facilitated by adopting the method here suggested. In cases of acute metallic poisoning, where the quantity of poison is generally considerable, the aqua regia solution could often be at once tested without further treatment. This was not, however, to be expected in a case where no poison had been taken for a fortnight before death.

The method of analysis pursued was as follows:—Each of the organs named (with the exception of the portions of the intestinal canal, which were examined together) was digested in a separate vessel, with a mixture of one part of nitric acid and two parts of hydrochloric acid, till it had dissolved (the fat excepted) into a clear pale brown liquid. This was allowed to cool, then diluted with water, filtered through calico, and evaporated to dryness. The residue was transferred to a hessian crucible, and heated till it was thoroughly charred. Diluted nitric acid was then boiled on the charcoal, filtered,

and evaporated to dryness; the residue was thereafter dissolved in dilute hydrochloric acid, and exposed to a stream of sulphuretted hydrogen, which threw down a brownish-black precipitate. This precipitate (sulphuret of lead) was collected on a filter, washed, and afterwards boiled with dilute nitric acid, which was then evaporated to dryness, and the residue dissolved in water acidulated with hydrochloric acid. To this liquid the tests for lead were applied. The steps of the process, it will thus appear, were somewhat numerous; but those who have engaged in such inquiries will agree with me, that it is always desirable, and worth while, to get rid, as completely as possible, of all organic matter before proceeding to the final testing for a metallic poison contained in an animal tissue.

The following tests were applied in each case, and acted in all quite distinctly, though not with equal intensity.

1. Sulphuretted hydrogen, which gave a dark-brown or black colour to the liquid, and ultimately a distinct precipitate (sulphuret of lead).

2. Sulphuric acid, which gave a white precipitate (sulphate of lead), soluble in caustic potass.

3. Iodide of potassium, which gave a yellow precipitate (iodide of lead).

4. Bichromate of potass, which, after neutralisation of the free acid by ammonia, gave a yellow precipitate (chromate of lead).

These four tests, taken together, I need scarcely say, are certain indications of the presence of lead. The quantity found was greatly too small to admit of comparative quantitative determination by appeal to the balance; but Mr Macadam and I were at one in regarding the spleen as the organ which yielded the most abundant and most deeply-coloured precipitates, and the intestinal canal as yielding the faintest indications of the presence of lead; next to the spleen we placed the liver, afterwards the lungs, then the kidney, and below it the heart, after which came the intestines. Without attaching too much importance to comparative observations, which do not admit of great precision, I feel inclined to consider our conclusion, regarding the occurrence of lead in greatest quantity in the spleen, as a fact, concerning which we were not mistaken; and when it is remembered how much smaller the spleen is than the liver, the lungs, or the duodenum and cœcum, it will be apparent, that if the quantity of lead which accumulates in each organ, in cases of slow poisoning, is in proportion merely to its size, the spleen should give much fainter indications, than the larger organs, of the presence of lead, whereas it exceeded them all in its behaviour with the lead-tests. Hitherto it has generally been held, although I do not exactly know on what authority, that the liver is the organ in which lead accumulates, and it has generally been selected as the viscus to be analysed, where the object was simply to ascertain whether lead had entered the body of an animal. Mr Herapath of

Bristol, for example, to whom portions of the mare were sent, confined his analysis to the liver, in which he found lead. It seems, however, worth the attention of physiologists and of medical jurists, whether the spleen does not rank above the liver as the organ *par excellence* in which lead accumulates. So far as the chemist is concerned, the spleen is probably the most convenient organ for analysis. Its small size, its loose spongy texture, and its comparative freedom from fatty matter, enable it to be rapidly and satisfactorily examined. In many cases, if lead were found in the spleen, it would not be necessary to seek for it elsewhere.

The only other conclusions I would draw from the analyses reported, are in conformity with those which have been drawn by preceding observers, in reference alike to the human subject and to the lower animals,—viz., 1st, That as all the organs subjected to analysis were found to contain lead, it is probable that, if additional parts of the animal had been analysed, they would have been found to contain it also, so that, in cases of slow poisoning, we may safely infer that a metal like lead comes to be diffused through the entire body, and exerts its poisonous action, though in unequal degree, on every organ; and, 2dly, That lead having once entered the body in this way, leaves it again very slowly, so that long after an animal has ceased to receive lead in its food or drink, we may expect to find the metal in its tissues; and the restoration of health must always be a protracted process.

If, however, MM. Orfila[1] and the other French chemists, who affirm that lead, as well as other metals, is a normal or constant constituent of animal bodies, are in the right, the conclusions stated must receive some qualification. On the question as to the *normal* occurrence of poisonous metals in the bodies of animals, I do not profess to give an opinion; nor do I imagine that there are data from which to decide the point, so far as the horse is concerned. My own limited experience would induce me to doubt the accuracy of the view, which represents lead as a natural constituent of the tissues of horses; for in the Derbyshire cases, where I wished and expected to find lead, I could not find a trace.

ARTICLE III.—*On the Nerves of the Orbit.* By JOHN STRUTHERS, Fellow of the Royal College of Surgeons, and Lecturer on Anatomy, Edinburgh.—(*Continued from p.* 322.)

BEFORE proceeding to inquire into the relation between the nerves and muscles, let us now understand clearly the actions of the different muscles of the eye in its various motions. Here we first separate the straight muscles from the oblique. The former per-

[1] Monthly Journal of Medical Science, March 1852, p. 271.

form all those movements by which we look in various directions, and in which the direction of the axis is changed. The four direct movements are performed each by the corresponding rectus acting alone. The four diagonal movements are effected each by the conjoint action of the two neighbouring recti. The oblique muscles are not necessarily in action during the performance of any of the above movements, nor are they concerned in their accomplishment. They turn the eye round on its axis. The superior turns the top of the eye round towards the inner canthus; the inferior rolls it back by an opposite movement, by which the lower part of the eye is turned towards the inner canthus. This is the action of each class on each eye; let us now see what relation the muscles have to those of the opposite eye in the various movements. Here we observe that the eyes are bound to each other in their motions, in order that the convergence of the axis to a greater or less degree shall never be destroyed; so that when the eyes are moved sideways a non-corresponding muscle must be employed. The superior rectus always acts with its fellow of the opposite side; so likewise the inferior. But were the external rectus to act with its fellow farther than is sufficient to bring the axes from convergence near to parallelism, divergence of the axes would result. Therefore, beyond this at least, the external rectus does not act with its fellow; but as, in looking sideways, one eye moves in when the other moves out, the action of the external rectus is attended by that of the internal of the opposite eye. The internal rectus, lastly, is or is not attended by the action of its fellow, according as we direct both eyes inwards, or look sideways; so that this muscle acts sometimes with its fellow and sometimes without it. It will thus be observed that the upper and lower recti always act with their fellows, that the external rectus never does so, and that the internal does or does not according as the movement is a corresponding or non-corresponding one. The various movements and muscles concerned in each, therefore, are:—*Corresponding*, or symmetrical. 1. Both eyes upwards; both upper recti. 2. Both downwards; both lower recti. 3. Both inwards; both internal recti. 4. Both downward and inward; both inner and both lower recti. 5. Both upward and inward; both inner and upper recti. *Non-corresponding*, or a symmetrical. 6. Right eye out, the left in; right external and left internal rectus. 7. Right eye downwards and outwards, the left downwards and inwards; right external and left internal, and both inferior recti. 8. Right eye upwards and outwards, left upwards and inwards; right external and left internal, and both superior recti.

Now as to the relation between the oblique muscles of opposite sides. As is stated by those who have written on the subject, the superior oblique of one side will be in action with the inferior oblique on the other. When the head is inclined over to the right

side, the action of the right superior and left inferior oblique is required. Consequently each oblique muscle acts with the opposite oblique muscle of the other eye; the action of either of them with its fellow of the other eye would rotate one of the eyes altogether in the wrong direction. This, however, holds good only of man and those animals in which the eyes look well forwards, and can be directed at the same time to the same object. As I have remarked in considering the anatomy and physiology of these muscles, it must be different in those animals in which the eyes are directed so much outwards that they cannot make the axes of both eyeballs converge, nor in any way use both eyes on the same object at the same time. Such are, among mammals, the hare and rabbit, and the three inferior classes of vertebrate animals generally. Now as both eyes here—in a bird, for instance, where the eyes are set quite in the side of the head, and look quite outwards—cannot possibly be used on the same object, it becomes a matter of less interest to inquire into the relation between corresponding muscles of opposite sides, as we do not know whether the animal is ever moving or attending to the sensations of both eyes at the same time. But supposing both eyes to be so employed, then, under the circumstances requiring the action of the oblique muscles, the corresponding oblique muscles will act together, the inferior with the inferior, and the superior with the superior. This action of the oblique muscles would appear to be still more required when the eyes are set in the side of the head, as in the simple movement of raising or depressing the head while an object is being viewed; as then the head moves as if on an axis approaching in direction to that of the eyes themselves. The superior oblique will be required to act when the head is raised, and the inferior when it is depressed. Whilst, then, we can see the necessity of the oblique muscles *to each eye* in these animals, we can say nothing as to any relative action of the oblique muscles on opposite sides, except that if the sensations of both eyes are attended to at the same time, then each oblique muscle must act with its fellow of the opposite side; but if not, there can then be no relative action between the oblique muscles of opposite sides; nor, indeed, could any advantage, so far as we can see, accrue to animals in which the eyes are so placed, were even the straight muscles associated in their action, as they are in man and all animals in which both eyes can be used forwards on the same object at the same time. In regard to the relation between the oblique muscles of opposite sides, we may therefore conclude that, in man and in animals, which use both eyes on one object, and in which the eyes are known to move consensually, the superior oblique of one side acts constantly with the inferior, not with its fellow, of the opposite side, and *vice versa.*

We are now, then, in a position to inquire into the meaning of the relative distribution of the motor nerves. The question of in-

terest is, why the external rectus and the superior oblique receive each a separate nerve, and whether this, together with the distribution of the third nerve to all the other muscles, can be connected in any way with the regulation of the ocular movements? I shall first notice a few of the observations which physiologists have offered on this subject, although I do so more on account of the authority with which they come than for any value which they appear to me to possess.

Valentin[1], more especially, has written on this subject, and has, with much argument and illustration, presented a theory. It is, that some of the muscles and nerves are voluntary, and the rest involuntary or automatic; and that the action of the voluntary nerves of the one side is attended by that of the automatic nerves on the other, for the non-corresponding movements. His voluntary nerves are the fourth and sixth, and the upper division of the third; the lower division of the third, supplying one-half of the muscles, being automatic or self-acting. Thus, he observes, the upward and outward movements are voluntary, the downward and inward involuntary or automatic. "All regular motions which are harmonious and a-symmetrical are so performed that on one side a voluntary muscle acts,—either the superior or external rectus or superior oblique; whilst, on the other, there is the harmonious action of a muscle more or less automatic."[2] That is, in the non-corresponding movements the voluntary muscles lead off on the side to which we look, and the automatic, or self-acting, muscles make the other eye follow. He finds no difficulty in bringing two of the so-called voluntary nerves to act together in raising both eyes, or two of the involuntary ones in depressing both eyes; but here the nerves are corresponding. Valentin, it may be observed, believes that the inferior oblique muscle turns the eye upward and inward, and we must infer, from the preceding remarks, which give the substance of his theory, that he believes the superior oblique to be concerned in some outward movement. I have stated this as his view in my paper on the muscles of the eye, following the account given of Valentin's views in another work, but in the original he nowhere makes this statement, so far as I can find. In enumerating the muscles concerned in the various movements, the only mention made in any of them of the superior oblique is in the following passage (p. 30):—"4. Uterque oculus primo initio ad interna et inferiora movetur. Quæ contractio aut m. m. rectis interno et inferiori aut m. m. recto interno et obliquo superiori simul agentibus evenit." His view as to the actions of the recti muscles is the same as that which I have given above, but the oblique muscles he brings in to assist in the inward diagonal movements of both eyes. When both eyes turn upwards and inwards

[1] De Functionibus Nervorum. 1839.   [2] Valentin, op. cit., p. 31, s. 69.

—a movement which he gives as involuntary—he employs the internal recti and the inferior obliques; when both look downwards and inwards, the superior obliques are brought in, according to the passage above quoted, to assist also the internal recti. Still it must be inferred, from his remarks on the nerves, that he believes the chief action of the superior oblique to be, to assist in an outward movement. But the superior oblique seems rather to stand in the way of this theory, as indeed of all others in which the oblique muscles are supposed to assist some of the recti. But, although we put aside that part of Valentin's theory which relates to the oblique muscles, it may be said that the same explanation may be shaped to our view of the action of these muscles. With due deference, however, to the high authority by whom it is proposed, it must be observed that the theory or explanation really does not explain what we wish to understand, or in any way render the matter more simple. It assumes that some of the muscles and nerves are involuntary, for which there does not appear to be any good ground; for if we take the ordinary ocular movements as we find them, without being influenced by any preconceived theory, no one appears to be more voluntary than another; and to say that one nerve is automatic, and necessarily acts with a voluntary one of the other side, is merely another way of expressing the fact that the one eye moves with the other, whilst what we are seeking for is some explanation of the fact itself.

There is next Müller's explanation.[1] The substance of his remarks, in endeavouring to explain the arrangement of the nerves and the harmony of the movements, may be given thus:—1. That the corresponding branches of the third nerve have an innate tendency to act together on opposite sides, evinced from the time of birth, and therefore due to some peculiarity of structure at the origins of the two nerves. The corresponding muscles supplied by them, therefore, always act together on opposite sides; and to explain why such is not the case with the internal rectus when we look sideways, he supposes that the internal rectus of the everted eye really acted, but was overcome by the stronger action of the external. 2. That the sixth nerve wants this tendency to act with its fellow, and that the strong action of the one is incompatible with that of the other. Also, that this enables us to understand why in all vertebrata the external rectus receives a separate nerve. 3. That the reason why the fourth also is a separate nerve is, that its muscle moves the eye downwards and outwards, and that therefore the opposite muscle is not to be employed.

Before commenting on this hypothesis, I may notice, lastly, the remarks of M. Ph. Berard, as quoted by Longet,[2] with the view of explaining why the external rectus and superior oblique receive

[1] Elements of Physiology. Trans. by Baly. 1835. Pp. 928-931.
[2] Op. cit., tom. ii., pp. 396, 397, 405.

separate nerves. He observes, that when we look up and down we no doubt use branches of the third nerve in opposition to each other; but this opposition is on the same side. But whenever we look out sideways, there is a double antagonistic action; for the external rectus is not merely the antagonist of the internal of the same side, but of the external rectus of the other side, in so far that they never act together. It was necessary, then, that one of the lateral recti should receive a special nerve; and he thinks the reason why it is given to the external rather than to the internal rectus is, that a more extended motion is required outwardly than inwardly. Also of the oblique muscles, in accordance with our view of their action which he holds, as each acts not with the corresponding but with the non-corresponding oblique of the opposite side, therefore one of them—the superior as it happens—has received a separate nerve; and, therefore, he adds, as "the same pair of nerves could not produce so complicated a movement, it was necessary that the superior or inferior oblique should receive a special nerve."

Now these theories, when examined, whilst they have an appearance of plausibility, in reality, so far as they are correct as to fact, amount to nothing beyond a mere statement of the fact. Passing over the part of Müller's theory which relates to the action of the oblique muscles, the fallacy of it in other respects is evident, as has been well pointed out by Dr G. Johnson,[1] in the first place by showing, that there really is no such tendency in all the corresponding branches of the third pair; and, secondly, by the observation, that "we must not suppose we are explaining the necessity for this arrangement by asserting, to use the words of Müller, that if, in place of the sixth nerve, the external recti muscles had received each a branch of the third nerve, it would have been impossible to make one of these muscles act without the other." M. Berard's remarks are likewise objectionable, from his assuming the necessity of there being separate nerves for opposite movements on the two sides; but they evidently, embracing as they do the correct view of the use of the oblique muscles, point to the only explanation of which the matter admits,—viz., that separate nerves *are* employed when, and only when, non-corresponding muscles are in action on opposite sides, whilst corresponding nerves, as is natural, are employed when the muscles are corresponding. Or, as Dr Johnson expresses it, "assuming that the use of the oblique muscles is such as we have mentioned, it is certainly curious to observe that when corresponding muscles of the two eyes are intended to act together, as the superior rectus of one eye with the superior rectus of the other, and the same with the inferior recti, both muscles are supplied by the third nerve; but the external rectus, which acts consentaneously with the internal rectus of the

[1] Cyc. of Anatomy and Physiology. Article, Orbit. 1844. Pp. 791, 792.

opposite eye, has a separate nerve, the sixth; and the superior oblique, which acts with the inferior of the opposite eye, has the fourth nerve entirely devoted to it."

Let us now, therefore, see what we really know as to the motor functions of these nerves. Of the third nerve, we have observed that it supplies muscles which act in the corresponding movements on the two sides; but the various branches act under different circumstances. The upper division supplies the levator muscle of the upper lid as well as the superior rectus. Now, the action of these two is frequently conjoined on the same side, the action of the superior rectus being usually accompanied by that of the levator palpebræ for an evident purpose; but not necessarily so, as we can, with very little effort, keep the eyelids closed, and at the same time move the eyes upwards; and again, the levator palpebræ acts often enough without the superior rectus, as when we are looking in any direction except upwards, the upper eyelids being raised sufficiently to expose the eye. There is, therefore, no necessary association in action on the same side of the two muscles supplied by the upper division of the third nerve. On opposite sides, the physiological relation of these two muscles is quite different. The levator palpebræ usually acts with its fellow, but not necessarily, so that, after a very little practice, one eyelid may be raised without the other, although at first this is effected, until the tendency be overcome, by the orbicular muscle keeping the lid down. Indeed the tendency to simultaneous action in the levator palpebræ muscles is not greater than that between the orbicular muscles of the two sides, supplied by the portio dura of the seventh pair. But no amount of effort or practice will enable us to use one superior rectus without the other. Of the lower division of the third nerve, the branch to the inferior rectus is exactly in the same position as that to the superior. The lower and upper recti are the direct opponents of each other, but they cannot act without their fellows of the opposite side. The branch to the internal rectus again differs from these. It acts in the direct or diagonal inversion of both eyes with its fellow, like those to the upper and lower recti, but, unlike them, not necessarily exactly in the same degree, as when the eyes converge unequally; and again, without its fellow and with the sixth nerve, as when we look sideways, in this case resembling the sixth nerve itself. And, lastly, the branch to the inferior oblique, according to our view of the use of the oblique muscles, will never act with its fellow, but, at the same time, as the fourth nerve of the opposite side, in this respect exactly resembling the fourth.

Farther, the muscles supplied by the third nerve do not seem to have, on the same side, any greater tendency to act with each other than with the muscle supplied by the sixth nerve. Although we use the upper and lower recti more frequently along with the internal than with the external rectus, still we do not feel

any more difficulty on one side than on the other when one eye is directed upwards and outwards, and the other upwards and inwards. Thus the upper division of the third acts as readily with the separate sixth nerve as with the nerve to the internal rectus, which comes from the same trunk as the former.

There is another branch of the third nerve—that to the iris, through the ciliary ganglion—the action of which is always, like that of the nerves to the upper and lower recti, attended by the action of its fellow of the opposite side. It is maintained by Müller,[1] that there is a necessary association in action between the iris and the internal rectus, and still more so with the inferior oblique. This falls more naturally to be noticed in considering the functions of the ciliary nerves; but I may observe here that this association between the iris and the internal rectus does not appear to be a necessary one, or due, as Müller supposes, to any contiguity or connection of their nerves. We observe, it is no doubt true, the consensual contraction of the pupil to occur always when the eyes converge on a near object; but this is not due merely to the internal recti being in action, but occurs simply because it is required when a near object is being viewed. The two occur together, because both are necessary to the viewing of a near object.

But the consentaneous contraction of one pupil may occur independent of the action of the internal rectus, as when we look out sideways at a near object. Here both pupils contract, whilst on one side the external, not the internal, rectus is in action. And again, in looking sideways at a distant object, one of the internal recti is in action, but both pupils are enlarged. Therefore the consensual contraction or dilatation of the pupils occurs simply according as we view a near or distant object, whatever may be the muscles employed. These remarks relate only to the consensual movements of the irides, the influence causing which must originate in the brain; otherwise the pupils are moved by reflex action, through the impressions on the retina, conveyed backwards along the optic nerve, and reflected outwards along the third nerve. Here the tendency to association is so remarkable, that an impression on one retina only, causes an equal contraction of both pupils. When the pupils act consensually,—*i.e.*, along with one or other of the muscles of the eye, the fact of their keeping exactly of the same size is only what we would expect to meet the purpose to be served; but when the action of the pupils is reflex,—*i.e.*, from the quantity of light, independent of any motion of the eyes, the fact of the impression on one eye causing an action of both pupils may seem to favour the view taken by Müller, that there is a peculiarity or identity at the roots of that part of the third pair of nerves which goes to the irides,—that is to say, that it is impossible for the ner-

[1] Op. cit., p. 773.

vous centre to act on the nervous fibrils which go to one iris without also acting on those which go to the other iris. But this hypothesis seems to be unnecessary. Symmetrical reflex action, when the irritation is applied to one side only, is at any rate not confined in its occurrence to the iris; but the fact, as affecting the latter, seems to me to be sufficiently explained by the decussation of the optic nerves. As each optic nerve divides, a part going into each tract, both sides of the nervous centre are necessarily and simultaneously affected by the stimulus. Thus the equal reflex action of both pupils is secured, independent of any inequality of the light falling on the two eyes, which, had there been no decussation, or had each nerve entirely crossed over to the other side, so that each retina regulated the reflex actions of one pupil only, would have caused an unequal state of the pupils; and thus we understand why an impression on one retina should cause a reflex action of the opposite pupil, just as readily and as completely as it does of the pupil of the same eye.

Next, as to the sixth and fourth nerves, we observe that they do not act along with their fellows, but with the antagonist nerve of the opposite side, the fourth with the nerve to the inferior oblique muscle, and the sixth with that, also from the lower division of the third, which goes to the internal rectus,—and that these nerves go to one of each of the two pairs of muscles which are employed in non-corresponding movements. As regards the sixth nerve, it is worthy of remark that, in animals which possess a retractor muscle, which is supplied by the sixth nerve, a part of this nerve acts differently. It is probably the case that the retractor muscles act at least generally together; and here we have a single nerve, part of which is generally used with its fellow, whilst the other part is not so, but with its antagonist of the opposite side.

Now, if we endeavour to explain all these differences in the different nerves, or different parts of the same nerve, by saying that each nerve has a certain endowment whereby it always, or sometimes, or never, acts with its fellow of the other side, we must recollect that we are merely expressing the fact that we observe such and such to be the case, and take care not to put it so that our way of stating the fact lead us to suppose that we have in any way explained it. The object of these differences in the mode of employment of all these nerves and muscles is, that both eyes may be used at the same time for single vision, and to accomplish this the eyes must move so that the axes shall always converge more or less. For this purpose, then, we have first suitable muscles; secondly, nerves going to each; and, thirdly, these nerves are subjected to a central in fluence, by which these motions, otherwise voluntary, are regulated so as to establish and preserve the harmony of the ocular movements. However that influence may originate, or whatever its nature, whether we speak of it as an instinctive action or original endowment, or an irresistible influence, or as partly the result of

the guiding sensations of the retinæ, there is such a central influence, which exerts itself, alike as a guide and check, on all the movements of the eyes, giving rise to a class of movements which stand by themselves, and can be compared to, or illustrated by, no others in the body. The nerves we should regard not as themselves possessed of special endowments, but merely as channels by which the nervous centres, with their special endowments, act down upon the muscles. The mere fact of the third nerve supplying the superior recti by corresponding branches, does not explain why these two muscles should always act together, because the neighbouring fibres to the levatores palpebrarum muscles are not so bound together. Again, the mere fact of the sixth nerve being a separate one, does not explain why the external rectus cannot be made to act with its fellow, from any endowment of the nerve, for that part of it which goes to the retractor muscle is not so tied up. But the reason why the nerves of the upper recti always act together, and why those of the external recti never do so, is simply, that they obey the central regulating influence; and the reason why the nerves which supply the levators of the upper eyelids may act separately, and that those from the sixth nerves to the retractor muscles in animals are not tied up from acting together, is simply, that such may be the case without interfering with the harmony of the ocular movements, by which the parallelism or convergence of the axes is preserved. Further, this regulating influence is exerted no less in the parallel than in the non-corresponding movements. We have just as little power of moving one eye up and the other down as of making both look outwards, the harmony is the same, and the central influence guides and controls alike in both cases. We are not, therefore, to conclude that it is only when the sixth and fourth nerves, and non-corresponding muscles, are employed, that this influence is needed or exerted. Still, when we look to those movements where non-corresponding muscles are employed, we observe that on one side a separate nerve is provided for the muscle. But we see no reason why this should be so, beyond the inference we draw from noticing the fact that it is so; nor are we to suppose that this explains why one eye follows the other in an opposite movement; we merely observe the facts together, and we therefore conclude that the design contained in the provision of separate nerves, the sixth and fourth, for the external rectus and superior oblique muscles, is explained, so far as it can be, by the circumstance, that one of these nerves is used on one side, when the movements are non-corresponding or in opposite directions; and it is, in connection with this, also remarkable, as before stated, that while the third or common nerve arises as near to its distribution as possible, the origins of these two single nerves are so remote and separate.

As regards the nature of the movements of the eyeballs, by which the direction of the axes is changed, we observe that they are all

perfectly voluntary,—that is, we can, when we wish, look with both eyes in any direction we choose, only the will is so subjected to the central regulating influence, that the two eyes are obliged to move conjointly, so as to preserve the convergence of the axes. But it is a very common belief, that there is likewise an *involuntary* movement of the eyes in the upward direction. This was maintained more especially by Sir Charles Bell, who describes the eyeballs as being turned involuntarily upwards in the act of winking, during forcible expiratory efforts, in sleep, fainting, and the insensibility preceding death. His theory as to the use of this motion in winking was, that the cornea is turned up in order that the mucus and impurities brought down by the lid might not be left across the cornea after being collected in the little triangular gutter, which was formerly supposed to remain between the margins of the closed lids and the cornea. The motion he attributed, on very theoretical grounds, to the action or influence of the superior oblique muscle and fourth nerve; but later writers attribute it to the involuntary action of the inferior oblique muscles. But it does not appear to have been very carefully inquired into, whether such movements actually occur under these circumstances. If the eye be forcibly exposed by holding up the eyelid, as in searching for a foreign body in the fossa of the conjunctiva, the eye may be seen to roll up; but this is a voluntary action, performed in order that the front of the eye may be placed out of danger deeply under the upper eyelid. But is it the case that the eye rolls up every time the eyelids meet, either in the ordinary winking motions, or that which may occur during the acts of sneezing and coughing? Is there any satisfactory proof that such a motion actually and regularly occurs? The statement that the eyeballs are turned upwards during sleep, is certainly incorrect. I do not say that they may not occasionally be so found, but they are not generally so; on the contrary, as Mr Mayo[1] remarks, in raising the lid of a person in sound sleep "the eye is found directed straight forwards; but in some instances the eye is directed upwards and outwards." That the eyes are sometimes rolled upwards in fainting and on the approach of death must have been observed by every one, both when the eyelids are wide apart and when they are nearly closed. But it does not always occur under these circumstances, and the direction is not constantly the same. The more common opinion seems to be, that they turn upwards and inwards, owing perhaps to the striking appearance which this motion gives; but it has seemed to me that the motion is more frequently directly upwards, and occasionally both eyes are turned a little upwards and outwards. Looking to their anatomy in man only, it was perhaps natural enough to ascribe this upward rolling motion to the inferior oblique, especially when no other use could be found for it; but it is not necessary for me to go back on this matter now to show that

[1] Anat. and Phys. Commentaries. 1822. Part ii., p. 6.

the inferior oblique muscle has quite a different purpose to serve, and is not, in all, so placed as to be capable of turning the cornea upwards. We must attribute these actions chiefly to the superior recti, acting sometimes with the internal and sometimes with the external recti, although we cannot explain why they should occur. That the upward direction is not always the same, shows that it is not an action of one muscle provided for this purpose; and that its occurrence is not invariable, shows that the motion is not an essential one.

But, according to the view maintained as to the use of the oblique muscles, their action cannot be held to be voluntary, in the full sense at least, as that of the recti muscles is so; for, as Longet has remarked, we do not seem to have the power of voluntarily turning the eye round its axis when the head remains fixed. Still this is not equivalent to regarding the oblique muscles as involuntary. They are subjected to the central influence, which prevents any motion from which double or confused vision would result; and we should have no power of using these muscles voluntarily, for the same reason that we cannot turn one eye up and the other down, or both eyes out. Still it may be said, as the regulating influence does not restrain the actual motion, but only regulates the motions of the two eyes, that if we use the superior of one side with the inferior oblique of the other, we should be able to twist the eyes round about. But this power would be of no use to us under any circumstances; and indeed such a movement of the eyes would be injurious to correct vision at all times, except when the motion is actually required. If we keep the eyes fixed on an object straight before us, and move the head round to the right side, by a motion at the joint between the two first vertebræ, we use, to keep the eyes fixed, the left external and the right internal recti; but if we bend the head down towards the right shoulder, we use the right superior and the left inferior oblique; we are alike unconscious of the effort in either case, both the motions are equally voluntary or involuntary, being performed under the direction of the guiding sensation.

There is just one other question concerning the oblique muscles which has not been considered. We have seen their relation to each other on the same side,—that they act alternately as direct antagonists; and also their relation to their fellows of the opposite side—that the superior of one side acts with the inferior of the other; and the remaining consideration is, what relation exists, if any, between the two classes of muscles, the straight and oblique, *on the same side*—whether either oblique muscle acts more with one rectus than another. First, we observe, as bearing on this, that the inferior oblique is seemingly grouped in nervous supply, by the inferior division of the third nerve, with the lower and internal recti; and this might lead us to suppose that it was associated in

action with these muscles more especially. This inference, however, is met by the considerations, that the arrangement of the motor nerves has reference more to the relative action of the muscles of opposite eyes; and that, as has been already remarked, the nerve to the inferior rectus acts as readily with the sixth nerve, as with that to the internal rectus, with which it is associated in origin. Also, that only one of each of the two pairs of muscles which act non-correspondingly receives a separate nerve, whilst the common nerve goes to all the other muscles in the orbit; and that, from the position of the muscle, it is as natural for the inferior oblique to be supplied by the division of the third nerve, which goes to the lower and inner recti, as it is for the levator palpebræ to be supplied from the division which supplies the superior rectus. Apart, however, from these reflections, on considering carefully which of the straight muscles will be more or less in action with each of the oblique muscles, it does not appear that there is any constant relation. It will depend very much on how far and in what way the two kinds of motion of the head are blended. The superior oblique will be in action as often with the internal rectus, and the inferior oblique as often with the external, as with any of the other recti muscles; and it therefore does not appear that there is in the same orbit any special association between either of the oblique muscles and one or more of the recti.

ARTICLE IV.—*Medical Topography of the Western Coast of Africa.* By D. RITCHIE, Esq., Surgeon R.N.—(*Continued from page* 328.)

NO locality on the surface of the globe enjoys a more equable climate than Sierra Leone,—the mean temperature of each month in the year ranging between 80° and 82° Fahrenheit. The diurnal range is rarely more than two or three degrees; and the annual range is also very limited, being comprised within 87° and 77° of the same scale. This remarkable uniformity is to be ascribed to its geographical position, and to the clouds or vapours which, in a greater or less degree, continually diminish the solar influence. In consequence of the former, the atmosphere is renewed by the equatorial current, tempered by the influence of the adjacent ocean, by the lofty chain of mountains, of which Sierra Leone forms the terminating link, and by the evaporation from the expanse of luxuriant vegetation existing in this parallel.

In consequence of the atmospheric moisture accumulating in proportion to the proximity of the sun to the zenith of this place, and diminishing as it retires to the southward, its heating power is very nearly equalised. The amount of aqueous vapour, however, is always large, except during a few weeks, beginning about

the latter end of December, when the harmattan sets in from the Great Desert, bringing with it an impalpable dust, and an unusual desiccating power.

Unless during "the rains," the wet bulb of Mason's hygrometer at mid-day is very uniformly between four and five degrees lower than the other, thus indicating an amount of moisture between ·700 and ·800 with the dew point ten or eleven degrees lower than the actual temperature.

As the sun approaches the zenith of Sierra Leone, tornadoes and electrical phenomena become frequent, with occasional light showers, particularly at night, during April, May, and June; but it is not until the return of the sun from the northern tropic in July, August, and September, that heavy or continued rains occur. During these months the former perturbations yield to the torrents which inundate the face of nature; but in October they return in the same order, and continue in diminished intensity until the latter end of December, when a perpetual blue haze throws a serene veil over the face of nature. This is scarcely disturbed for the next three months by any meteoric change.

The peninsula of Sierra Leone contains a population of about 4000 negroes and 100 Europeans. The former consists of liberated slaves and emigrants from the adjacent country, presenting in their physical conformation very characteristic features of the tribes to which they belong. In Free Town, which contains about one-third of the entire population, the streets are wide and dry, with sufficient declivity to prevent the lodgement of water; and the houses are generally surrounded with a small garden, and consequently are detached from one another, thus guarding against, as far as practicable, the concentration of animal life and vegetable effluvia.

The physical peculiarities of a locality distinguished for its destructive influence on the health of Europeans, and for its being the only apparent source whence the epidemic fever along this coast derives its origin, must be a subject of the utmost importance and interest to all who are engaged in investigating the causes of disease, and in advancing civilisation. The climate of Sierra Leone may also be considered as forming a type of every littoral situation, from the River Gambia to Cape Lopez, a distance of about 2000 miles. Modifications indeed, arising from circumscribed causes, exist; and these will be mentioned as the description of the coast line is pursued; but the general characters remain the same, and will not require to be repeated.

To what *peculiarity*, then, of climate, of situation, or of febrific influence, is to be ascribed the *inherent power* which the *endemic fever* of this settlement, or of its neighbourhood alone, is said to possess in generating *epidemic disease?* Is it owing to some modification of the common malaria, or to the propagation of a new and distinct poison by European visitors, at a period in naval history,

when the defective measures for the maintenance of health exposed a crew, with constitutions shattered, to morbific agents, which their vital resistance was unequal to cope with, and thus converted the predisposed into a weltering mass of disease and death ? Or does it arise from the atmosphere being saturated to the last degree with the diffusive products of the whole breadth of continent, over which, as the equatorial current, *it* has slowly passed, in a parallel remarkable for the numerous rivers by which the continent is traversed, and for the mass of luxuriant vegetation with which it is covered ? To these questions no very decided answers can be given ; but the mass of evidence, and the almost unanimous opinion of the medical officers who have been, or are resident, in the colony, coincide in *affirming* the latter supposition. If, however, the common endemial fever really passes merely by gradation into the virulent contagious epidemic (which fortunately only at distant intervals develops its malignity), it is certainly remarkable that the local affection does not exhibit any general difference in type, in degree, or in prevalence, to that which exists elsewhere. It assumes always the character of remittent fever, even in cases where complications or collateral conditions appear to modify it. Europeans almost universally, and even natives, are subject to be attacked by it ; but neither of them in a greater degree than in many other localities along this coast. Here, as elsewhere, it appears as the result of a reduced or deranged state of the vital powers, produced by any of the numerous causes which affect these. That the Europeans are more disposed to disease will not appear unaccountable, when we take into consideration the effects of a relaxing climate, and a mode of life opposed to the enjoyment of perfect health, and contrary to their former habits. These act by reducing the nervous energy, and consequently diminishing and disturbing the assimilating and secreting functions. From these again proceed an accumulation of effete and imperfectly-organised matters, which are disposed to enter into new and poisonous compounds on the application of an efficient cause. This cause, uniform in its results and essentially identical in its properties, is so powerful and general on the coast of Africa, as comparatively to supersede all other morbific agents, or so to modify them as to form a common connecting link between nearly every manifestation of diseased action—as in every case of essential fever.

This is more particularly observable in affections of assimilating and secreting organs; but in many others it may be traced without difficulty, as in the predisposition to dysentery and to derangement of the nervous centres. The former was more prevalent formerly, when a mechanical irritant was introduced into the system by the internal use of water laden with debris from the adjacent mountain, at the commencement and during the continuance of "the rains." Since the employment of iron pipes, to prevent the contamination which arises from the action of a rapid torrent upon

a loose soil, the frequency of this affection has diminished; but there cannot be a doubt, that the constitutional liability to it remains the same.

Pulmonary diseases are comparatively rare, and arise most frequently from the irritation produced by the impalpable dust with which the atmosphere is loaded during the time the harmattan blows. A proportion of the effect must, however, be ascribed to the cooling of the surface produced by the unusual amount of evaporation ensuing from the rare dryness of the atmosphere. This influence must be more sensibly felt in proportion to the greater activity and importance of the cutaneous functions in this climate and among the negro race.

Cutaneous affections are frequent and grave from the same causes. The derangements which dispose to these are without doubt often induced and aggravated by circumstances connected with the slave trade. This remark applies more particularly to the most prevalent and peculiar of these affections—craw-craw, framboesia, and lepra. The others are merely examples of generally diffused diseases, and present nothing peculiar beyond the common characters which belong to the diseases of this coast.

Morbid action is almost universally characterised by congestion, and a disposition to advance to disorganisation of the vital structures. This is a deficiency of vital power, not of excessive action or organic energy. It may sometimes happen that cases arise, among those whose constitutions have not been deteriorated by a sojourn in the climate, which seem to contradict this statement; but they must be very rare, if they ever really occur. Observers are prone to mistake the irregular and convulsive struggles of debility for the tense and prolonged efforts of organic power.

This tendency of disease is fearfully aggravated by those conditions of the system characterised by a diminution of vital cohesion, as is observed in scorbutic affections. Where a disposition to scorbutus is present, in those suffering from the effects of a depressing and asthenic poison, the progressive decomposition of the vital structures becomes so rapid and unmanageable, as to assume the character of a malignant disease, in which the putrefactive process has begun before life is extinct. It is even probable that this rapid and general destruction of vital affinities may, by permitting a profuse evolution of new combinations, be the efficient cause of distinctive epidemics. Facts leave no room to doubt that the great mortality which has often, in a contagious form, visited our fleets and armies, arose very generally among those who were already suffering from an impure atmosphere and a restricted diet, both of which change and loosen vital structures. A wise foresight and a humane care have effected ameliorations in these, which permit us to behold it at a distance in the page of history without dreading its approach.

The necessity of confining these remarks within certain limits, obliges me to leave this subject and Sierra Leone. Once more at

sea, we find a light breeze almost constantly blowing from the south-west, on the shore along which we run in a south-easterly direction. A few small islands are passed, which stand like the advanced guard of the distant mountains. They are verdant with waving palm trees, and appear so lovely as to be always a delightful object to the passing voyager. They are named the Bannana and Plantain Islands, and have been described as little paradises, but in reality they are not free from the common endemial fever, although there neither the stagnant and putrid marsh, nor the effluvia of putrefaction, may be detected by the most fastidious organs of sense.

The distant mountains having gradually shelved away, nothing now meets the eye but the white sandy beach, and a long wavy dark line of primeval forest impending over it. Sherbro—a long sandy island formed by the deposits borne hither by several rivers, which the surf has thrown back across their mouths, scarcely breaks the continuity of the line, until we reach Cape Mount—a low hill covered with shaggy wood, whose granite base is washed by the never-ceasing waves. This again is succeeded by the low ivory forest, until we arrive at Cape Mesurado—a rounded headland of primitive formation resembling the preceding, about 200 miles from Sierra Leone. It shelters a small sandy bay, on the eastern side of which is situate that interesting settlement called Monrovia, formed by the free negroes from the United States. The surrounding country is flat, covered by a dense forest, and traversed by a sluggish river, which rolls its muddy waters through mangrove swamps. Although, from these circumstances, the soil is very fertile, yet the situation of the colony appears to have been injudiciously chosen, where so many more advantageous sites might have been selected, and with as great facility appropriated.

A similar configuration and formation of coast to that contained in the foregoing description, extends in an easterly direction for the next 800 miles, until we reach Cape St Paul. It bounds a vast undulating plain, which rises gradually to the foot of the lofty range of mountains, which, under the names of Loma and Kong, at a distance of between 200 and 300 miles, maintain nearly a parallel course to it. While the northern sides of these are drained by the tributaries of the Niger, the southern declivities give rise to numerous rivers, which intersect and irrigate the whole expanse, and render it unboundedly fertile. They pursue a comparatively direct course to the sea, into which they discharge their waters by numerous mouths. These are all more or less unfitted for navigation, by the bars which the surf has thrown across them.

In consequence of the flatness of the surface, which is broken rarely by low swelling hills, the drainage is imperfect; and in the rainy season stagnant pools of water are very frequently scattered over its entire surface. To these are attributable the dysenteric affections which are prevalent, and that remarkable parasite the

Dracunculus. In other respects, the endemic diseases are the same with those belonging to Sierra Leone, as a comparison of the two climates would have led us to expect they would be. We must, however, regard, as an exception to this, the contagious form of fever which has always appeared an important disease, and never one engendered by local influences, however conducive these may be deemed to the propagation or preservation of the germs of the disease in their entire activity. That part of the coast which runs nearest with the latitude is considered more salubrious than that which, pursuing the form of the continent, takes a north-westerly direction. This is attributable to the attraction of the land acting directly against the equatorial current, and thus restraining, as in circumscribed vortices, a confined and contaminated atmosphere.

No difference is observable in the climate from that of Sierra Leone, further than the earlier progression of the seasons by a fortnight. Neither superior salubrity, convenient harbours, nor abundance of commercial produce, render any part of this a desirable settlement for Europeans. On these accounts, those which have been formed at a great sacrifice of treasure and life are all in a sickly and declining condition. No doubt, however, can exist, that the amazing fertility of a country so extensive, so full of mineral riches, so temperate, and so well watered, must in time be brought under the harrow, and its dormant resources made available to the support and happiness of an immense population, instead of being, as at present, hid amid its own wild luxuriance, which the apathetic labours of the scattered savages scarcely restrain from burying their narrow fields and miserable huts.

From Cape St Paul to Cape Lopez, embracing a coast line of more than 1000 miles, the character of the climate and of the shore is very uniform. At Cape St Paul begins that remarkable breakwater, which, in the form of a crescent, extends for nearly 400 miles round the Bight of Benin to Cape Formosa. It is formed on the one side by the sand thrown up by the surf, and on the other by the debris from the rivers which flow into the natural canal formed by it. Here their natural outlet is obstructed until a weight of water accumulates sufficient to overcome the barrier, which is continually renewed by the ocean. At Cape St Paul the canal or lagoon joins the rapid stream of the Bolta; at Little Popoe it communicates directly with the sea; again, at Lagos and Benin, and between that and Cape Formosa, with the mouths of the Niger. It is never stagnant; but as it extends into broad sheets of water resembling lakes, its current is sluggish, and only remotely affected by the tides.

The breakwater itself is a narrow, barren, sandy ridge, elevated only a few feet above the level of the sea, and in general incapable of culture, or of forming a situation for the habitations of men. The scanty soil nourishes only shrubs or stunted trees; but the opposite shore, until we approach the river Benin, is a rich alluvial

plain, intersected by rivers, and in every respect resembling the country previously described between Cape Mount and Cape St Paul. This configuration of land sinks near the River Benin into the low swampy Delta of the Niger, which extends from this to the foot of the Cameroon Mountains, presenting a coast line of above 250 miles, through which, by numerous mouths, the sluggish and turbid waters of that noble stream meet the ocean, after anastomosing with each other by a hundred tortuous channels.

The whole constitutes a vast alluvial plain, so slightly elevated as to be partially washed by every returning tide. A dense mangrove forest throws a funereal gloom over the black and slimy waters which creep among its tangled roots, and scarcely leaves space for the amphibious population, which thinly inhabits the drier portions of the soil. This part of Africa is interesting, from the profitable trade which has been established in the estuaries of its noble rivers—the Benin, Brass, Bonny, New Calabar, and Old Calabar. A steady increase is also promised, through the extent of inland navigation that is available along the parent stream—the Niger.

It is pleasant, after the eye has been wearied by contemplating, day after day, an unvarying line of white surf and blue forest, to behold the gigantic outline of the Cameroon Mountains, rising dimly through their misty shrouds. Rugged, and covered with lofty trees to their summit, they rise to the height of 13,000 feet abruptly from their sea-worn base. The sun rarely penetrates the veil of vapour which hangs round the numerous cones which rise one above another irregularly until the highest disappear from the view. On their southern base, along the side of a beautiful little harbour, is situate a native town, and a missionary establishment, named Bimbia. The latter stands on an elevated headland, from which, by the beauty of the situation, and the appearance of civilisation and refined taste, it seems to possess a moral influence, enhancing the benign precepts which its amiable and devoted tenants have endeavoured to diffuse around.

The Cameroon Mountains are of volcanic formation, and form part of a ridge which runs in a northerly direction, under the names of Rumby and Qua. It also maintains to the south-westward a submarine course, only emerging in the islands of Fernando Po, Prince, St Thomas, and Anna Bona. These all possess a similar volcanic character, and a similar influence on animal life.

Fernando Po, the most important of these, lies about twenty miles from the mainland. On approaching it, the eye is delighted with the view of a bold shore, festooned with creeping plants, over which is a lofty forest, variegated with every tint of the most luxuriant vegetation, and sloping gently upwards until it reaches the abrupt sides of the central mountains, up which it runs in picturesque masses, until it reaches the very summit,—a height of about 10,000 feet. The whole earth does not possess a soil more

fertile, or a climate more congenial to vegetable life. From the moisture condensed around the lofty peaks, or the frequent rains, numerous rivulets of crystal water leap down the umbrageous valleys, and neither expand into languid pools nor feed morasses. No stagnant water, nor accumulation of decaying organic matter, anywhere exists. The other islands of this group present the same features in a diminishing degree, as they recede from the central elevation. Unless in Prince's Island, and there only in a contracted space, no swamp, nor stagnant water, nor any other recognised source of malaria exists. It is therefore unnecessary here to enter further into details, which will come more appropriately under consideration when their common climate is described.

From the Cameroon Mountains to the north, the land forms an undulating dry plain, which rises abruptly from the eastern boundary of the Delta—the Old Calabar River. On its shelving bank, about forty miles from the sea, in a position happily chosen amidst a numerous population, Duke Town is situate; where another of those centres of civilisation—a missionary establishment—diffuses its humanising influence. Here the activity of commercial enterprise, and the spiritual power of a divine revelation, are making an impression, which it is hoped will deepen and expand over this moral waste.

To the south of the Cameroon Mountains, lies the broad estuary of a river of the same name. Its banks present features resembling those of the Gambia, and, in a minor degree, of the Niger: flat, alluvial islands, presenting a sea front of about fifty miles, and extending into the interior from ten to twenty miles, clothed with mangrove forests, when they meet a beautiful champaign country, spreading away broad and pleasing, on whose cultivated patches a scattered population enjoys abundantly all the necessaries of life.

As we advance along the shore to the southward, beyond the narrow sandy beach and its interior chain of lagoons, low hills, running parallel with them, produce an agreeable variety, which is at last broken by the river Gaboon and its tributaries. Here low alluvial islands, resembling those at the mouth of the Cameroon River, and a marshy tame shore nearly under the line, present no favourable prospect for the settlement which the French have formed. Again, as we advance, the former configuration of the land returns, until we reach the rocky promontory Cape Lopez (nearly one degree to the south of the equator), which is a well-defined point of demarcation between the climate of the Bights of Benin and Biafra, and that of the southern part of the coast.

The anxiety to compress within the narrowest limits the preceding description of the land, will not, it is hoped, tend to keep out of view any material fact. I have endeavoured to give a connected sketch of this coast line of a thousand miles, from its possessing

throughout a similar climate, and similar influences in generating disease. Over all, a leaden-coloured sky, laden with eternal vapour or dense dark clouds, throws a perpetual gloom. The dark brown sea that washes its shores eddies round from west to east, and again returns seaward to perform its unvarying circuit. Contaminated with the tributes poured into it by wide muddy rivers, and teeming with animal life, it becomes in a measure a tepid stagnant pool. On moonless nights, when the winds are sufficiently strong to ruffle the surface, myriads of scintillating animalcules shed a pale blue light, sufficiently powerful to enable the eye to read with facility moderate-sized print.

The languid winds blow almost continually from the south-westward on the land, where they are rarified by the greater heat of the surface, and, ascending into the higher regions of the atmosphere, return in an opposite direction, bearing with them the diffusible products of the soil and of organic matter. This compensatory circulation is nearly always distinctly marked by the movements of the clouds, of which the upper strata are almost invariably proceeding in a direction opposite to the breeze. Such is obviously the active movement of the atmosphere; but a slow displacement must always be constantly progressing from east to west, depending on the general law which regulates the currents of the fluid coverings of the globe. In the Bights of Benin and Biafra, the course of the year is scarcely divided into seasons by the changes of heat and cold, or by the periods of activity and decay in the vegetable kingdom. There is an irregular double winter and summer, produced by the passage of the sun twice across the equator in the year. On this account there are properly two *rainy seasons*, divided by short periods of comparatively settled weather. The longest of these is when the sun has receded to its greatest distance in December and January,—the other in August; but atmospheric vicissitudes are common during the whole year. During February and March, these are more violent; but heavy and continued rain is more frequent in April, May, June, July, September, October, and November. In the first and last of these months, it descends generally in the form of light passing showers; but in the middle ones in heavy and continued torrents. Electrical phenomena are frequent during the whole year, but more particularly during February, March, and April,—September, October, and November. They are often attended by that violent atmospheric commotion called "the tornado."

The mean annual temperature at 8 A.M. is 79° 33′ Fahr., at 2 P.M. 80° 40′ Fahr.; being only an average diurnal range of 1° 07′ Fahr. The coldest month in the year is August, which has a mean temperature at 8 A.M. of 76° 90′, at 2 P.M. 77° 90′; and the hottest month is December, which has at 8 A.M. a mean of 81° 40′, at 2 P.M. 83° 50′; showing the greatest monthly range to be only 5° 05′. While the mean temperatures are so nearly the same, the

extreme range is also confined within narrow limits,—the highest observed being 86° 50′, the lowest 74°. As these observations were made at sea, they must be understood to be lower and more equable than if they had been made on land. The steady temperature of the surface of the sea, ranging between 76° and 83°, must have a permanent influence upon these results; but the following hygrometric observations may reasonably be considered more widely applicable. They were registered by Mason's hygrometer, and the deductions are made from tables supplied by that instrument. The mean difference between the dry and wet bulbs at 8 A.M. was 2° 44′, at 2 P.M. 2° 79′, indicating a dew point between three and four degrees below the actual temperature, and an amount of moisture at 8 A.M. equal to ·855, at 2 P.M. ·820.

The barometer ranged between 30·10 and 30·30; but as a guide to the weather its oscillatory movements appear scarcely applicable.

In the neighbourhood of Cape Lopez, the climate undergoes a great change. The sluggish uniformity of the Bight is replaced by fresh south-westerly breezes,—its sullen sky and fumid heat, by rolling clouds or a clear atmosphere, which impart to the sensations a buoyancy and vigour never felt within the recurrent breezes of that fatal gulph. Rain is, however, frequent and often extensive. Thunder-storms are also very common. All these changes appear the result of the drier and purer atmosphere of the south coast mingling with that of the north, which is saturated with moisture, and possesses a very different electric tension.

No part of the world obtains the character of being so prejudicial to the health of Europeans as the shores of the Bights of Benin and Biafra, and their contiguous islands. Remittent fever, of an asthenic and fatal form, threatens all who visit them. No variety of soil or local influence averts the common scourge, or appears either to mitigate or augment its force. Yet life, and even health, may as certainly be preserved amid the flat mangrove swamps on the banks of the rivers Benin and Bonny, as on the declivities of the Cameroons, or the high shores of the adjacent islands. In the month of December 1849, when the writer visited the river Benin, he saw two individuals—one a native of the north of Europe, who had been a resident for fifteen years; the other a native of Ireland, who had dwelt for nearly three years in that pestilential locality—neither of whom had suffered from endemic disease. A similar fact was at the same time observed in the very differently constituted island of Fernando Po; and other instances might be mentioned, showing that the common influences pervading this part of the world are independent of the configuration of the land. The enjoyment of good health must, however, be regarded as the exception to the rule which regulates life in this insalubrious climate. It is, therefore, necessary to consider it in relation to its influence in generating disease. In this respect Fernando Po bears, per-

haps, the pre-eminence, in consequence of the destructive epidemic which raged there from the settlement by the British in 1827, almost until it was abandoned. This, however, was an imported disease, rendered continuous by the arrival of successive emigrants and the uniformity of the climate, and therefore affords no fair criterion by which to judge of it. There cannot be a doubt that the germs of disease, depending on a certain amount of temperature and moisture for their constitution and development, will continue and increase so long as these conditions and a germinating area exist. Taking this for granted, it becomes obvious that the disease referred to will endure permanently in this island, as long as susceptible individuals arrive to multiply the germs,—in consequence of the vapour, which, like a mantle, almost perpetually covers the lofty mountains in the interior to their base, well nigh completely arresting the process of evaporation, stimulating the vegetating affinities, and nearly altogether obliterating the changes of the seasons. At the same time a most malignant form of ulcer prevailed—the result, probably, of the same cause, modified by some collateral influence concentrating that poison in a circumscribed area, which would otherwise have overwhelmed the whole system. The correctness of these views is supported by the fact, that neither of these diseases has been observed to be endemic since that time; for although numbers of Europeans have continued to be exposed in every variety of circumstance to the influence of the climate, they have experienced only the usual results which attend a similar exposure elsewhere.

From this experience opinions have so changed that Europeans now gladly retire from the low dark shores of the Delta to breathe here what they believe to be a purer atmosphere, but perhaps in reality only to evade the wearisome monotony, alike exhausting to the patience and depressing to the spirits, which after a lengthened residence in this quarter is so apt to be felt. A hasty view might lead to the supposition, that a locality where the emanations were to a certain extent confined, and consequently became concentrated by surrounding circumstances, would be found the most active in generating disease, but such an opinion would be at variance with the fact; for fever of as malignant a type has arisen as certainly, if not more so, from exposure in the dry and comparatively naked shores of Anna Bona, as at Duke Town on the Old Calabar, which can only be reached by a tortuous navigation of above 400 miles, among low alluvial islands, covered with swamps and impenetrable forests, and over which the sea breeze blows with a sickly languor.

Believing, then, that a specific poison is equally common to the whole extent of surface under consideration, there is still a curious fact which deserves to be mentioned. It has frequently happened that several individuals have been simultaneously seized with the same disease, indicating a special and concentrated evolution of the

noxious excitant. What the peculiar cause of this may be, is still indeed a mystery, but the laws which regulate it are more in accordance with those which belong to organic than to gaseous products. It appears from its effects to arise only at distant and irregular periods, to be confined within narrow limits of space and time, and to affect only peculiar habits, producing no deleterious effect on those not predisposed, as a chemical or mechanical irritant may be supposed necessarily to act.

A correct view of the influence of this climate in generating disease, will, it is presumed, be obtained from the following statement of the diseases prevalent during a period of six months, among a crew numbering altogether 140 individuals, of whom twenty were negroes. Fifty cases were placed on the sick list, exclusive of injuries, the effects of violence. Of these the most important, although not the most numerous, were fevers, numbering in all seventeen cases. A great diversity was observed in their relative severity and duration, some terminating after one paroxysm, others assuming almost a continued form, and a very complex identity, by the similarity of their symptoms and termination on the ninth day. These were all the result of exposure to the influences of the soil, while employed in proximity to, or in actual contact with, it in the rivers of the Delta. Of the whole, one individual died, whose age (forty-six) and general character would have rendered him a probable victim to any severe form of fever. All the others completely regained their health and strength without relinquishing the vessel or the service.

The class of cases most numerous, but the least important in regard to their severity or duration, were cutaneous and subcutaneous affections,—they numbered in all twenty-two cases. Some of these were connected with a cachectic, others with a scorbutic, disposition; but they all recovered under appropriate treatment.

Affections of the lungs and air-passages included four cases of no importance. This immunity must not be understood to apply always to these affections; for I observed a case of the most malignant kind of pneumonia prove fatal in less than thirty-four hours, a result hastened, no doubt, by a complete change in the character of the blood, and its want of a vital cohesion proportional to the impulse of a hypertrophied heart. Such cases are generally the result of the same impressions on the cutaneous surface which excite in the system similar affections in this climate.

Affections of the membranous structures included two cases,—one of rheumatism, the other of ophthalmia,—neither of which have been found generally prevalent or intractable forms of disease.

The remaining class of affections—those of the abdominal viscera, included four cases,—hepatitis, dysentery, dyspepsia, and dysuria; all important from the disorganisation they are disposed to induce, or from the deteriorating influence they exercise upon

health. They were all, however, under a careful method of treatment adapted to the circumstances of each, conducted to a successful termination.

Whilst the preceding summary gives a fair view of the state of health on board of vessels cruising off this part of the coast, it may not do the same on land, or in vessels remaining long in contiguity with it. In these cases it is probable that fever is more prevalent, and its results less favourable,—that new forms of disease arise as old ones disappear,—and that, altogether, diseased action is more intractable, and its results more unsatisfactory.

That remarkable disease which is characterised by an invincible inclination to sleep and to slow decay, is not infrequent at Fernando Po and the adjacent islands. It runs its course in about six months, and its inevitable end is death. It appears to be connected with *ramollissement* of the brain, but it is impossible for one who has not personally examined the disease to form a correct opinion.

The protective power of malaria is not sufficient, as some have supposed, to ward off pulmonary consumption. Permit me here to pay a small tribute of respect to the memory of that pure-hearted and zealous missionary, the Rev. Mr Merrick, whose christian character and high intellectual endowments were accomplishing so much for the cause of humanity and religion when this disease approached, and the writer had the regret to see him at a time when he was far beyond the reach of human aid. Although this case and two more are very distinctly impresssed on my memory, it must be acknowledged that the disease is comparatively rare, and, in relation to the mortality of the coast, occupies a very minor position.

The character of diseased action over the area to which the preceding remarks apply, is identical with that already described when treating of Sierra Leone. The congestive and disorganising tendencies are perhaps even greater; but it would be rash to hazard an opinion on this matter, when the sources of error from collateral circumstances are so numerous.

It is proper to state, that in the preceding review of endemic influences they have been considered chiefly with regard to their effects on the constitution of the European. The African is, however, by no means exempt, and it even appears probable that a similar liability to morbid action extends over the whole animal kingdom. Horses perish, cattle are puny and multiply sparingly, the forests are comparatively destitute of birds, and the air of insects—leaving vegetative organisation to pursue its uninterrupted course of silent energy.

(*To be continued.*)

ARTICLE V.—*An Account of some Experiments on the Diet of Prisoners.* By ROBERT CHRISTISON, M.D., V.P.R.S.E., Professor of Materia Medica in the University of Edinburgh.

IN 1850 the General Board of Directors of Prisons in Scotland were induced by circumstances, which for brevity's sake may be here omitted, to make a series of observations, with the view of accurately ascertaining the effect of the prison diet on the bodily condition of the prisoners under their superintendence. These observations were conducted on a scale, and with a care, unequalled, so far as I know, by any investigation of the kind hitherto made public. The results appear valuable, alike in a practical point of view, and in relation to the physiology of nutrition. On this account, and because the numerical data were entrusted to me for analysis, I have requested leave from the Directors to make the results known; and they have kindly granted this permission.

The object of the inquiry was to ascertain, with every possible accuracy, whether the dietary of the regulations of the board was sufficient, and not more than sufficient, to maintain the health and condition of the prisoners. For this end, it was resolved to begin with those prisoners whose term of imprisonment varied between ten days and two months, and to judge from the results whether the same dietary might be made the subject of trial in circumstances of more doubt and nicety,—viz., for prisoners sentenced to long terms of imprisonment.

The observations were made on 896 males and 724 females, in the prisons of Edinburgh, Glasgow, Aberdeen, Dundee, Stirling, Paisley, Ayr, and the County Prison of Perth. Each prisoner was weighed at admission, and his state also noted as to health, strength, and condition. Similar observations were made once every fortnight afterwards, and finally just before liberation. To the data thus obtained were annexed the ages of the prisoners, together with any incident occurring in the course of the experiments, which might be thought to influence the numerical facts. During the progress of these observations, which were continued for three months, from 2d December 1850 till 2d March 1851, the prisoners were kept steadily on one dietary, differing slightly, however, in the different prisons. At the same time, the governors of the prisons were empowered to withdraw from experiment any individual whose health should appear to suffer sensibly from the diet.

The simple numerical facts, amounting to about 8000 observations on the weights of the prisoners, and as many on their apparent health, strength, and condition, were then put into the hands of Dr Maclagan and myself for analysis, without any attempt on the part of the officers of the Board or of the Prisons to arrange or

generalise them, the Directors being anxious that we should investigate them without the possibility of a bias.

Taking the Edinburgh dietary as the dietetic basis in these experiments, it appears that the food of the prisoners consisted of oatmeal porridge and butter-milk at breakfast and supper, and broth and bread, or pea-soup and bread, at dinner. The broth, which was given five days a week, consisted of barley, vegetables, meat, salt, and pepper; the soup of pease and pease flour, with meat, salt, and pepper, and this was given twice a week. Supposing the broth and soup of each week to be distributed, so as to supply a uniform proportion of each on every day, the result is, that the average real daily nutriment of each prisoner was, in round numbers, seventeen ounces avoirdupois, of which four ounces were nitrogenous and thirteen carboniferous. By nutriment is here understood the sum of nutritive proximate principles in the dry state. No other estimate has any pretensions to accuracy. The details which yield this result are contained in the annexed table.

Nutriment in the Edinburgh Prison Dietary.[1]

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal	10· oz.	1·36 oz.	7·04 oz.	8·40 oz.
Butter-milk	25·0 „	1·50 „	0·50 „	2·00 „
Bread	6·0 „	0·41 „	2·92 „	3·33 „
Meat	1·0 „	0·22 „	0·14 „	0·36 „
Barley	2·14 „	0·30 „	1·47 „	1·77 „
Peas	1·0 „	0·23 „	0·60 „	0·83 „
Vegetables	2·0 „	0·03 „	0·20 „	0·23 „
Total daily nutriment		4·05 „	12·87 „	16·92 „

To those who have made the dietaries for bodies of men a subject of scientific study, the allowance of nutriment here indicated may appear small for a class of individuals, the greater proportion of whom are at the most active periods of life, and follow in prison some useful occupation. It contrasts strongly, for example, with the Navy dietary for seamen, who have almost twice as much nutriment, and still more with that of harvest reapers in Scotland, who have nearly three times as much. Nevertheless, as the following facts will show, the prison dietary of Edinburgh is sufficient in the circumstances of the prisoners on whom these observations were made.

[1] The chemical data for calculating the results of this table are taken chiefly from a table of nutritiveness laid before the chemical section of the British Association at its meeting in Edinburgh, in 1850, by Dr Lyon Playfair.

Thus, of 556 male and female prisoners in the prison of Edinburgh, 197 were found at their discharge to have maintained weight, 259 to have gained on an average two pounds and a quarter each, and 100 to have lost each on an average one pound and a half. Hence 82·0 per-cent had gained or maintained weight, and 18·0 per-cent had lost weight. The average loss was quite insignificant. The greatest loss sustained was five pounds in two instances, four pounds in three, and three pounds in one.

It is scarcely possible to have stronger evidence of the adequacy of a dietary, especially considering that not a few people may lose a little weight with no great detriment.[1] An equally satisfactory result is deduced from observations on the apparent health, strength, and condition of the prisoners. This is not so precise a criterion as the other for ascertaining slight differences, owing to the impossibility of using a fixed standard of comparison. On making the comparison as impartially as possible, however, it appeared that not a single prisoner of the 556 had lost in apparent health and condition; and that 110 of them, or almost 20 per cent., had manifestly improved in these respects. It is worthy of remark, that in the latter category there were 17 who had lost each a pound and a half on an average, and that one of these lost three, and another four, pounds.

The result of this section of the observations is altogether so favourable, that, so far from any fear arising lest the dietary of the Edinburgh prison should prove defective in nutriment, a suspicion might very naturally be excited, that it may be rather redundant in that respect. I believe this suspicion was actually entertained in some quarters; but I do not know on what grounds. That it was really groundless—and that practical experience had taught the authorities the precise limit to which the nutriment might be reduced consistently with the preservation of health and condition—will sufficiently appear from what follows.

In the prison of Glasgow the amount and quality of the nutriment in the diet was almost precisely the same as in the prison of Edinburgh. The details were somewhat different, inasmuch as barley-milk, made of pearl-barley and skimmed-milk, was substituted for broth on one day every week, and cheese for pea-soup on another day. But the analysis of an average day's dietary

[1] Although it is true that some people in a state of health may lose weight considerably without injury to their health, and that probably most persons may lose a little without any material harm, this is no objection, as some contend, to the test of loss of weight, applied on a large scale,—especially to persons of the class of prisoners,—being taken as evidence of a dietary being inadequate. All observation tends to show, that, when a large proportion of a body of men lose sensibly in weight, ill health is at no great distance; that their bodily strength is impaired; that they will soon become comparatively unable to grapple with the exciting causes of disease; and that, in the end, diarrhœa and scurvy are apt to be engendered among them, if the defective diet be long continued.

shows that the nutriment was all but identical, the nitrogenous ingredients being 4·06 ounces, the carboniferous 12·58, and the total nutriment 16·64 ounces.

Nutriment in the Glasgow Prison Dietary.

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal	8·86 oz.	1·20 oz.	6·23 oz.	7·43 oz.
Butter-milk	22·14 "	1·33 "	0·44 "	1·77 "
Bread	7·71 "	0·52 "	3·75 "	4·27 "
Meat	0·71 "	0·16 "	0·10 "	0·26 "
Barley	1·71 "	0·24 "	1·16 "	1·40 "
Peas	0·91 "	0·21 "	0·54 "	0·75 "
Skimmed-milk	4·00 "	0·18 "	0·22 "	0·40 "
Cheese	0·30 "	0·20 "	0·00 "	0·20 "
Vegetables	1·45 "	0·02 "	0·14 "	0·16 "
Total daily nutriment		4·06 "	12·58 "	16·64 "

Although the results of this dietary were satisfactory, they were not so entirely favourable as in the prison of Edinburgh. Of 549 male and female prisoners in Glasgow, 299 gained, 71 maintained, and 179 lost weight. That is, 67·3 per-cent had improved or remained stationary, and 32·66 per-cent fell off. The average diminution of weight was also greater than at Edinburgh, being nearly four pounds for each prisoner; and 15 of them lost so much as 7·25 pounds each. Farther, the state of the prisoners as to apparent health, strength, and condition, was likewise conformable. For four individuals had evidently suffered in these respects, and only 13 per-cent, instead of 20, as in Edinburgh, had improved.

Results remarkably similar to these may be deduced from observations made at the prisons of Aberdeen and Stirling. In these two prisons the diet was at least equal in nutriment to that of Edinburgh. Without going into greater details, it may be sufficient to mention, that the average daily allowances in a week's dietary contained, in Aberdeen, 3·98 ounces of nitrogenous, 13·03 carboniferous, and 17·0 total nutriment; and in Stirling, 4·27 nitrogenous, 13·4 carboniferous, and 17·67 total nutriment. The effect on the prisoners was as follows:—Of 143 male and female prisoners in both prisons, 71 gained, 26 maintained, and 46 lost weight,—that is, 68 per-cent either maintained or gained weight, and 32 per-cent lost in that respect. The average diminution among the latter was 4·2 pounds each, and 8 of the 46 lost each on an average 9·5 pounds. The number who improved in apparent health and condition was 14, or 9·75 per-cent; and those who fell off in these respects, were 5, or 3·5 per-cent.

The results thus supplied from the prisons of Glasgow, Aberdeen, and Stirling are in themselves satisfactory. Still they are not so favourable as those obtained with the same diet at Edinburgh. They raise a suspicion, that in Glasgow, Aberdeen, and Stirling there was some adverse cause which made the same diet less perfectly nourishing than in Edinburgh. Sundry conjectures might be formed as to what the cause may be. Since none of these conjectures can be tested with the information at present existing, I shall leave the question here unconsidered. But, as the general health and condition of the prisoners in all the three prisons must be admitted to have been satisfactory, it is a reasonable presumption that the moderate loss of weight in so many as a third part of the whole 692 prisoners was owing to some slight defect in the adjustment of the diet to their particular circumstances.

If this conclusion be correct, it will follow that the dietary of the Edinburgh prison, which I set out with assuming as the dietetic type for these experiments, is not too redundant in nutritiveness, since it proved not entirely sufficient in some difference of circumstances so minute or obscure as to be inappreciable with present information.

It certainly proved to be insufficient in another of the prisons, where the circumstance that made it so was not far removed from view. In the prison of Ayr, of 42 male and female prisoners, only 12, or 29 per-cent, gained or maintained weight; while the large proportion of 30, or 71 per-cent, lost weight. The loss sustained by each of the 30 was five pounds on an average, in 6 of them the average loss was nine pounds, and in 5 the governor of the prison found it necessary to increase the allowance of food. Nevertheless, the nutritive value of the diet in the Ayr prison was quite as high as in that of Edinburgh. The prisoners had skimmed-milk instead of butter-milk at breakfast and supper, and barley-milk instead of broth on two days of the week. The average daily food in consequence contained, as appears from the following table, 4·17 ounces of nitrogenous, 13·06 carboniferous, and 17·37 total nutriment.

Nutriment in the Ayr Prison Dietary.

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal...............	10· oz.	1·36 oz.	7·04 oz.	8·40 oz.
Skimmed-milk.......	27·86 „	1·67 „	0·56 „	2·23 „
Bread..................	6·0 „	0·41 „	2·92 „	3·33 „
Meat...................	0·71 „	0·22 „	0·14 „	0·36 „
Barley.................	3·5 „	0·49 „	2·40 „	2·89 „
Vegetables...........	1·44 „	0·02 „	0·14 „	0·16 „
Total daily nutriment.........		4·17 „	13·20 „	17·37 „

It is easy to understand why this dietary was insufficient in the particular circumstances. For a large proportion of the prisoners, unlike those of Edinburgh, Glasgow, Aberdeen, and Stirling, were agricultural labourers—muscular, bulky men—accustomed to much exercise, and a liberal supply of ordinary labourer's food. This circumstance was pointed out as the probable cause by the governor of the prison, and it is evidently sufficient to account for the result.

If farther evidence were wanting to prove that the standard diet used in these experiments was not unnecessarily nutritive, it may be found in the following singular facts:—

The prisons of Dundee, Perth, and Paisley were circumstanced in all ordinary respects, but one, like those of Edinburgh, Glasgow, and Aberdeen. The prisoners were of the same denomination; their employment in prison was much the same; their regimen in other respects was also much the same. But nevertheless the result of the observations on their weight and general condition is very different. Summing up the data from the three prisons conjunctly, since they lead to nearly the same numerical results in each, it appears, that, of 330 prisoners, 165, or exactly 50 per-cent, maintained or gained weight, and the same number and per-centage lost weight to the amount of 4·3 pounds each on an average. Of those who lost, there were 23 in whom the average diminution was 7·75 pounds. In point of health, strength, and general condition, only 49, or 15 per-cent, are stated to have improved; while 14, or 4·2 per-cent, manifestly fell off.

The only circumstance which can be discovered to account for the inferior condition of the inmates in these three prisons, was an inferiority in the quality of their nutriment. This inferiority is not manifest to ordinary practical observation, otherwise it would have been corrected. But it can be irrefragably proved by a scientific analysis of the dietaries.

By a regulation for adjusting the prison dietaries, treacle-water might be substituted by the governors for milk at breakfast and supper. This equivalent had been introduced some years ago on authority which was supposed to justify its adoption. But the substitution often occasioned discontent among the prisoners, and sometimes embarrassment to the board and other prison authorities; and not without reason, because treacle, a purely carboniferous article of nutriment, can be no true equivalent for milk, which abounds in nitrogenous matter.[1] Taking the Dundee dietary as an

[1] An extraordinary blunder is often committed by practical men in regulating dietaries, or writing about them, when they overlook milk as a source of nutriment, misled, probably, by its being a liquid. It becomes a solid aliment in the stomach by coagulation, and contains from eight to fourteen per-cent of real nutriment, of which about a third is nitrogenous. Fine qualities of it actually contain not much less than a half of the nutriment in beef and mutton.

example, it was found by analytic reduction to be constituted as in the following table :—

Nutriment in the Dundee Prison Dietary.

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal...............	10· oz.	1·36 oz.	7·04 oz.	8·40 oz.
Treacle	1·9 „	0·0 „	1·40 „	1·40 „
Bread..................	6·0 „	0·41 „	2·92 „	3·33 „
Meat	1·0 „	0·22 „	0·14 „	0·36 „
Barley	1·7 „	0·24 „	1·16 „	1·40 „
Pease..................	2·0 „	0·47 „	1·20 „	1·67 „
Vegetables...........	2·0 „	0·03 „	0·20 „	0·23 „
Total daily nutriment		2·73 „	14·06 „	16·79 „

This table shows that the average daily allowances contain, in round numbers, 2¾ ounces of nitrogenous nutriment, 14 ounces of carboniferous nutriment, and in all 16¾ ounces; so that the total nutriment is the same as in the dietary which answered so well in Edinburgh, Glasgow, and Aberdeen; but the nitrogenous nutriment, which supplies the necessary repair for the constant waste of the tissues, was less than in that dietary in the ratio of very nearly two to three. This is a most material reduction. No very evident effect, indeed, resulted to the health of the prisoners. But an injurious effect could not fail to ensue under a more prolonged use of such a dietary.

It is a singular circumstance, which adds to the confidence felt in the scientific method of investigating such a subject, that the average loss of weight sustained by the prisoners in Dundee is closely accounted for by this deficiency in nitrogenous nutriment. The Edinburgh dietary contains 28 ounces weekly of nitrogenous nutriment. The Dundee dietary contains 9 ounces less. In the course of eight weeks the difference will amount to about 4½ pounds: the actual loss was 5¼ pounds.

Having proceeded thus far in the inquiry, it occurred to me that I was now in a condition to ascertain whether the common notion is correct, that, in at least the working classes of the community, the amount of food required for maintaining the health, strength, and condition of the body, is much the same for both sexes, for all periods of life between puberty and old age, and for individuals of all ordinary weights or sizes. This notion is scarcely founded in physiological probability; but it is invariably acted on in regulating the dietaries of bodies of men.

If it be true, we should find, that, when a dietary is very nicely adjusted for the generality of a body of men, as appears to have

been the case for the prisoners in Edinburgh, Glasgow, Stirling, and Aberdeen, the adjustment will be found equally correct for all denominations. If, on the contrary, the notion be false, the error will stand forth in such numerical observations as were made in the present inquiry.

First, then, as to the two sexes, it appears that in Edinburgh prison, of 273 males 72 lost weight, and of 283 females only 28; that is, 26·3 per-cent of the males, and only 10 per-cent of the females. In Glasgow, of 309 males 127 lost weight, and of 240 females only 52; that is, 41 per-cent of the former, and 21·7 of the latter. The difference in Aberdeen prison is not so great. Of 55 males 21 lost weight, and of 30 females 9; that is, 38·2 per-cent of the former, and 30 per-cent of the latter.

Next, as to the bulk of the prisoners, I have compared together those males who weighed less than 150 pounds with those who weighed that much or more, and with the following results:—In Edinburgh, 210 male prisoners weighed less than 150 pounds, and 63 at least reached that standard. In Glasgow, the numbers were 258 and 51; in Aberdeen, 40 and 15. In Edinburgh, the per-centage of the lighter denomination who lost weight was 23·3; but of the heavier 36·5. In Glasgow, the per-centages were respectively 38·7 and 53·0; and in Aberdeen, 30 and 60.

Lastly as to age, it seems reasonable to infer, that growing lads, between sixteen and twenty years of age, must require more nutriment than those who have attained maturity; because their bodies must be not only maintained, but likewise enlarged. Placed on a uniform diet, therefore, if that diet be very nicely adjusted for the generality, the former may suffer when the latter do not, or in a less degree. In Edinburgh prison a perceptible difference was shown. Of 80 male prisoners between sixteen and twenty years of age, inclusive, 31·2 per-cent lost each on an average a pound and a-half in weight; while among those above twenty the percentage was 24·3. In Glasgow, the difference was somewhat greater. Of 88 growing lads, 53·4 per-cent lost in weight at the rate of four pounds and a-half each; but males above twenty lost weight only in the proportion of 36·2 per-cent. In Aberdeen, the number who lost were proportionally almost the same in both denominations; but the prisoners of each class were rather few to yield safe results.

The following conclusions may be drawn from the preceding statements:—

1. For the average of people whose occupation involves moderate muscular effort and no great exercise, a simple, well-selected sort of food, supplying seventeen ounces of daily real nutriment, of which four ounces are nitrogenous principles, constitutes a sufficient diet for maintaining health, strength, weight, and general condition; but less is not sufficient.

2. The proportion of nitrogenous nutriment in such a diet cannot be very sensibly reduced below four ounces a-day without risk of injury.

3. This amount of nutriment, though in general adequate for the average in the supposed circumstances, is not always so.

4. It is probably inadequate for those who have been accustomed to a vigorous occupation in the open air, and a liberal dietary, even when their employment is changed for one involving no great muscular effort or exercise.

5. It is inadequate for a fair proportion of persons considerably exceeding the average in bulk.

6. It is inadequate for a considerable proportion of growing lads between sixteen and twenty.

7. It is more generally adequate for females than for males.

8. It is rendered occasionally inadequate by other causes not distinctly indicated by the observations in the Scottish prisons, but certainly independent of any increase in habitual muscular exertion.

9. Hence the economical regulation of the diet of bodies of men must always be a matter of great difficulty; and if deviations from the standard dietary be not allowed with a liberal discretion, injury will be apt to ensue. And here it should be added from other observations, that suspicion may be lulled by no very perceptible injury except loss of weight occurring in ordinary seasons; while, nevertheless, manifest injury will arise in periods of epidemic disease.

10. The prison dietary in Scotland has been very successfully adjusted by long experience in most of the prisons, so far as regards the class of prisoners who formed the subject of the preceding observations and experiments,—viz., those imprisoned for terms not exceeding two months. But in that dietary treacle-water cannot be substituted for milk without a reduction of flesh, the forerunner of probable ill health, unless some compensation be made in other articles of food. It has, in fact, been disallowed by the Board since these experiments were made.

11. In adjusting dietaries, and in all practical inquiries into the subject, reliance ought never to be put in practical observation alone; but scientific analysis should be likewise brought into requisition. I could quote numberless errors committed by merely practical men, which could scarcely have escaped notice had they united scientific knowledge to practical skill. Let me conclude with one only, which happened lately near the fountain-head of knowledge on this subject.

It appears from the Report of the Inspector of Prisons in Scotland for 1851, that the condition of the prisoners in Carlisle Jail was far from satisfactory during the previous year. Of 68 persons only 9 had gained or maintained weight; and 59, or almost 87 per-cent, had lost on an average six pounds and a half each. This is

worse than even what has been noticed above as to Ayr Prison; where it was judiciously thought advisable to discontinue the experiments in several instances. The Inspector expresses his surprise at the result, and, in adding the dietary in an appendix, makes no commentary upon it. Consequently it would appear that he did not suspect the cause to lie there. Yet by scientific analysis nothing can be more clear than that the diet was faulty.

The Carlisle dietary presents ten different scales for the several denominations of prisoners. The class of prisoners coming nearest those who were made the subject of observation in the Scottish prisons, comprises "Prisoners at hard labour for terms exceeding two weeks, but not exceeding six weeks, and those not at hard labour, but confined for terms between two weeks and three months." From the following analysis of their average daily food, it appeared that these prisoners received only 2·5 ounces of nitrogenous, and 11·16 carboniferous nutriment, or 13·66 ounces in all:—

Dietary of Carlisle Prisoners confined from 14 *to* 42 *days.*

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal	8 oz.	1·09 oz.	5·62 oz.	6·71 oz.
Skimmed milk	11 ,,	0·66 ,,	0·33 ,,	0·99 ,,
Bread	6 ,,	0·41 ,,	2·91 ,,	3·32 ,,
Potatoes	7 ,,	0·09 ,,	1·53 ,,	1·63 ,,
Barley } [1]	0·86 ,,	0·12 ,,	0·58 ,,	0.70 ,,
Meat } [1]	0·50 ,,	0·11 ,,	0·07 ,,	0·18 ,,
Vegetables } [1]	1·00 ,,	0·02 ,,	0·12 ,,	0·14 ,,
Total daily nutriment		2·50 ,,	11·16 ,,	13·66 ,,

It is evident that both the one and the other species of nutriment are inadequate, if the preceding inquiry is trustworthy; and especially that the nitrogenous part is deficient, as it is impossible to supply the waste of the tissues with only two ounces and a half of nitrogenous nutriment daily.

The next class of prisoners, comprising those at hard labour between six weeks and three months, and those imprisoned for more than three months, but not at hard labour, had in round numbers three ounces of nitrogenous nutriment, and twelve ounces of carboniferous nutriment. The articles of food were all of good quality; and as no fault is found with any other part of the management of the prison, it may be presumed that no material

[1] The composition of the soup has not been given. I have assumed it to be the same with that of the Scottish prisons.

mismanagement existed. A sufficient explanation of the loss of weight will be found in the scantiness of their food, which is proved by the following analytic reduction:—

Dietary of Carlisle Prisoners at hard labour between 42 and 90 days, or confined longer without hard labour.

	Rough Weight.	Nitrogenous Nutriment.	Carboniferous Nutriment.	Total Nutriment.
Oatmeal	10 oz.	1·36 oz.	7·04 oz.	8·40 oz.
Milk	11 "	0·66 "	0·33 "	0·99 "
Bread	6 "	0·41 "	2·91 "	3·32 "
Potatoes	4·57 "	0·06 "	1·01 "	1·07 "
Barley } [1]	0·86 "	0·12 "	0·58 "	0·70 "
Meat } [1]	1·30 "	0·30 "	0·18 "	0·48 "
Vegetables } [1]	1·00 "	0·02 "	0·12 "	0·14 "
Total daily nutriment		2·93 "	12·17 "	15·10 "

This also is much too little. It is two ounces less than what has been proved above to be just sufficient for shorter terms of imprisonment without hard labour; and no principle is more securely established, relative to the alimenting of bodies of men, than that the nutriment must increase with increase of labour or prolongation of confinement. This principle, indeed, has been so distinctly recognised in various late inquiries upon Prison-discipline, that it is now known to be one of the difficulties which lie in the way of inflicting prison punishments. If prisoners be punished by diminishing their usual food, it is impossible for them to do the same amount of work for many days together. On the other hand, if they are punished by hard labour, the expense of maintenance must be increased by considerably increasing their food, otherwise it is impossible for them to persevere.

Resting on this principle, it will be seen that there is no encouragement in the results of the observations upon prisoners in Scotland confined for terms within two months, to extend the experiments with the same diet to those imprisoned for longer terms. This was an object held in view by the Board of Directors. But the dietary being found just sufficient, and no more, for the former class, and in some circumstances insufficient even for them, the effect of applying the same diet to prisoners confined for long terms may be pretty confidently predicted as likely to prove unfavourable. With due and obvious precautions, the experiment might be tried

[1] The composition of the soup has not been given. I have assumed it to be the same as that of the Scottish prisons.

with perfect safety, but with very small chance of a satisfactory result. Other incidents in the late history of these prisons lead to the same conclusion; but they could not be noticed here without disproportionate details. I may recur to them hereafter. For the present it is better to confine myself to the deductions which may be drawn from the observations lately made in the Scottish prisons.

The following table may be added, for the purpose of showing in one view the nutritive value of the several dietaries referred to above, and their respective influence on the weight of the prisoners subjected to them:—

	Ounces of Nutriment.			No. in 100 prisoners whose weight was		Average lbs. lost by each.
	Nitrogenous.	Carboniferous.	Total.	Maintained or increased.	Diminished.	
Edinburgh	4·05	12·87	16·92	82·0	18·0	1·5
Glasgow	4·06	12·58	16·64	67·3	32·6	4·0
Aberdeen	3·98	13·03	17·01	68·0	32·0	4·2
Stirling	4·27	13·40	17·67			
Ayr	4·17	13·20	17·37	29·0	71·0	5·0
Dundee	2·73	14·06	16·79	50·0	50·0	5·25
Perth	2·68	14·11	16·79	46·0	54·0	3·3
Paisley	Not fully reported.			56·0	43·5	3·2
Carlisle	2·5	11·17	13·67	13·04	86·96	6·5
Do. hard labour	2·93	12·17	15·10			

Part Second.

REVIEWS.

Researches into the Pathology and Treatment of Deformities in the Human Body. By JOHN BISHOP, F.R.S., Member of the Council of the Royal College of Surgeons, &c. &c. &c. London: Highley & Son. 1851.

THE title of this work led us to expect some new or comprehensive views, which might prove interesting and instructive to our readers; but we find that it is only another variation on the old theme of "spinal curvature," with some observations upon club-foot and lateral bending of the knee-joint. Having so lately (in

our last Number) had occasion to consider what points with regard to curvature of the spine may be regarded as definitively settled, and which of them still remain open for discussion, we may at present merely refer to our conclusion, that the only room for question as to the lateral kind is limited to the practicability of remedying the deformity, after the bones have become altered in shape, but have not acquired the complete consolidation of maturity. Mr Bishop here gives us little encouragement, remarking that when patients arrive at this stage, "they become the subjects of experiments which usually only torture them, at the expense of their health, time, and money."

So far we are much inclined to agree with the author, but should fail in our duty if we were not to complain that, while in nowise adding to the information previously acquired, he has done a good deal to muddle and perplex it. Our readers conversant with nursery literature are doubtless well acquainted with the ambitious youth who held his head so high that he was always falling into difficulties, easily avoided by his neighbours of humbler views; and it seems to us that Mr Bishop has suffered from a similar tendency. He regards mathematics and algebra as the grand unravellers of physiological, pathological, and practical difficulties, and thinks that—

"A better state of things may be now expected, since the Royal College of Surgeons has instituted examinations in mathematics, which will lead to a knowledge of the principles of animal mechanics, on which the treatment of distortions must necessarily be based."—P. 2.

He expresses the most simple idea in algebraic language, and proves it by a mathematical demonstration. Thus he deduces the elasticity of bones from the sounds they yield when properly excited into a state of vibration.

"For instance, let us suppose the figure of any two bones to be the same; that they are of similar length, breadth, and thickness; that they are made to vibrate in a similar manner; and that they differ with respect to the proportion of the earthy compared with that of the animal matter, and also in their specific gravity: now the number of vibrations which they yield will be directly as the square roots of their elasticities, and inversely as the square roots of their specific gravities, and it will be found that any increase of earthy matter will cause the elasticity to increase faster than the specific gravity; and therefore the bones which have the greatest proportion of earthy matter will produce the most acute sounds; and if we take perfect segments of the bones of old persons and of children, we shall find that the bones of the former will produce the more acute sounds of the two, in consequence of their greater elasticity."—P. 11.

Having thus established to his own satisfaction that old bones are more elastic than young ones, he quotes certain authorities to show that the spine, in consequence of its triple curvature, is sixteen times stronger than if it were straight; but adds, in a note, "this must surely be altogether a mistake." From this indication, we suspect the author has suffered from the confusion which will be the inevitable lot of his readers; and therefore, leaving him to

pursue his speculations, and heartily congratulating ourselves that we have no prospect of being examined upon them at Lincoln's Inn Fields, we may attempt to gather some practical inferences which will tend to show the sort of fruits produced from such a course of investigation.

Of all the procedures which have been introduced into the modern practice of surgery, there is no one that stands out more prominently as a useful and well-established improvement than the division of tendons or muscles causing deformities by their preternatural contractions. Wry-neck, squinting, and club-foot in all its forms, but especially that distinguished as the "*pes equinus*," which were either entirely hopeless, or admitted only of the most trivial palliation through all other modes of treatment, may now be remedied at once, with little or no pain to the patient,—easily, safely, and effectually. It is difficult, indeed, to imagine any change more creditable to the healing art, or more worthy of being held up as an encouragement to those who are desirous of elevating the surgical profession. We were, therefore, little prepared for the condemnation of this practice in the following unqualified terms:—

> "On a careful and rigid examination of the subject of myotomy and tenotomy, it appears that these operations cannot, in the majority of cases, be deemed expedient for the purpose of curing deformities, as nothing can be obtained from them which may not be effected by other and less objectionable means. The excepted cases, if any really exist, are strabismus, and other analogous affections; but even these are to be regarded with great suspicion. The best surgeons of the French school have already decided against the practice, and few of our most eminent English surgeons adopt this empirical plan of mutilating the body."—P. 61.

If such sentiments be sanctioned by the Council of the College of Surgeons, we need not feel surprise at the cold reception which other proposals for the improvement of practice, however well received elsewhere, have experienced in London.

Instead of following Mr Bishop through the mazes of his pathological wanderings, we may simply state, that they do not lead to a single idea of the slightest practical utility, and are calculated to confuse the views, however clear, derived from other sources. But we think it our duty to take this opportunity of protesting against the present sickly fashion of attempting to elevate the qualifications of medical practitioners by cramming them with oppressive and incongruous studies. It requires some boldness to express such a heterodox sentiment, but, believing confidently in its soundness, we do not hesitate to do so, with the same frankness, as when we find that some devoted parent, under the instructions of a fashionable London physician, has been endeavouring to rear a vigorous offspring through the constant administration of calomel, wine, and chopped meat. Attendance in the schools, and on courses of professional instruction, beyond a due limit, are, in our opinion, worse than useless; and if the studies which are of the highest value in

the way of preparation—such as mathematics and algebra—are mixed up with those of a more advanced kind, or merely "got up" for passing an examination, a mental indigestion of the most hopeless character may be expected.

Mr Bishop seems to think that mathematics and algebra are to be used directly for the advance of medical science, and has accordingly fallen into the errors of many learned men, who have at various times pursued a similar course. We are very far from undervaluing the importance of these and other departments of mental cultivation, but must maintain, that in our profession, as a practical employment, they are of use rather in training the mind to accuracy than by admitting of direct application to the solution of difficulties.

Nothing can, in our opinion, be more preposterous than the attempt of the College of Surgeons of England to establish two grades in the profession, of Licentiates and Fellows, by lengthening the attendance and multiplying the examinations requisite for obtaining the latter title,—unless, indeed, they expect to accomplish the well-known difficulty of making a silk purse out of a sow's ear; or, what comes to the same thing, convert common-place persons into men of talent and distinction. The Edinburgh College of Surgeons, we venture to suggest, have adopted a wiser course in giving their diploma to those only who have been found fully qualified to practise every department of their profession, and requiring for the Fellowship nothing further, except the decision of a ballot, and the payment of a certain sum to the funds of the corporation,—all the Fellows thus associated having an equal voice in the management of its affairs.

Life of Dr John Reid, late Chandos Professor of Anatomy and Medicine in the University of St Andrews. By GEORGE WILSON, M.D., &c. 12mo. Edinburgh, 1852. Pp. 316.

THE principal incidents in the life of the late Professor John Reid, of St Andrews, are so well known to most of our readers, that it is unnecessary for us to condense the narrative contained in the work before us. He was a man of honesty of purpose and rectitude of conduct. He exhibited great perseverance in scientific research, combined with unusual caution and accuracy in deriving conclusions from it. He was a teacher, first, of Anatomy, then of Physiology. He acquired an extensive knowledge of Pathology; and when he died, he was actively engaged in the prosecution of Natural History and Comparative Anatomy. Many of his published Memoirs will long be referred to as containing most important additions to the science of Physiology. He possessed great bodily strength, and firmness of character; and submitted to painful operations, and the physical sufferings of his fatal illness (epithelial cancer of the tongue and

neck), with corresponding courage and resolution. His disposition was manly, honourable, and kind; so that he was not only beloved by his friends, but esteemed by all who knew him. In consequence, his death, at the early age of forty, excited extensive and deep regret.

Dr Wilson's biography, while it does full justice to Reid's general character and scientific labours, is essentially a religious work. It is intended to point out how a man of the character we have alluded to, whose mind had been previously absorbed by scientific pursuits, seeing the slow and—as he knew—sure approach of death, was enabled to meet it with a rare calmness, owing to the sincerity of newly-acquired religious convictions. To all classes of the community, it is in this respect calculated to convey an important lesson, and to satisfy them of the beneficent influence which religion may exercise on the strongest minds during the physical and mental agonies which attend a protracted and painful dissolution. So far this biography is a tale which has been often told; but one, we are bound to say, that has seldom been told so well. No one who reads it can for a moment doubt the earnestness of the writer, or of the man whose life he describes; and though there be much that is fanciful, there is nothing of that nauseous cant which our modern pharisees thrust so unscrupulously and unskilfully into their writings.

Dr Wilson, in the course of the work, has seized upon appropriate occasions for entering upon topics which are likely to prove interesting and instructive to the general reader. Thus, when we are told that Dr Reid received the degree of M.D., the ceremony of conferring it is described. His appointment as President of the Royal Medical Society offers an opportunity for giving an account of the various student associations which exist in this University. His lectures on physiology induce the author to give a popular exposition of the nature and objects of that science, and, in addition, some considerations regarding medical lecturers. The following passages not only deserve attention, but are good specimens of the author's style:—

"The temptation of a young lecturer is to address himself to the clever students, who are sure to appreciate him, and in whose eyes he desires to appear worthy of his vocation. They, however, are exactly the portion of his class which least needs his help. The stupid students, a very small minority, if existent at all, must be left to creep at their own pace, or be recommended to choose another calling; and if the teacher can persuade the incorrigibly idle, who haunt the back seats of every class-room, to refrain from any greater cause of annoyance to their more busy brethren and himself than the drawing of his portrait, or the carving of their own names on the benches, he may be content. The majority of a class may always be safely assumed to consist of young men not extremely enthusiastic in the pursuit of truth, or disposed to take an enormous amount of trouble in following the lecturer, but quite ready to appreciate his efforts to make his science intelligible and attractive to them, and most quick to perceive and to recompense his endeavours to serve and assist them.

"It is a nice matter to determine whether the teacher should appear chiefly

as the judge or as the advocate. Dr Reid, with his characteristic truthfulness and honesty, preferred generally the judicial function, thinking that if the evidence in reference to a disputed question really preponderated in one direction, intelligent students could not fail to see this, and would attach more value to a conclusion they had drawn for themselves than to one forced upon them. There are some minds, nevertheless, which cannot draw, but can only receive conclusions, and which, if left to themselves to judge of disputed points, arrive only at a negative scepticism. A practical calling, like medicine, has no room for professional sceptics, who must either be hypocrites or self-deceivers; whilst it must always expect a large number of its members to act only as rational empirics, and as imitators of the few leaders who can give a reason for their mode of procedure. Such persons must be treated like a jury from whom a pleader, conscious of the justice of his case, insists on winning his verdict; and Dr Reid, exactly because he never displayed any anxiety to compel an acquiescence in his individual opinions, was peculiarly likely to secure this, when he earnestly urged on his hearers that but one of two competing views could be true."—Pp. 82, 83, 84.

With the remarks embodied in the first paragraph we fully concur, believing that nothing is more mischievous in medical education, than for lecturers who are teaching the elementary classes to bewilder their hearers with abstruse doctrines, which no sensible or practical mind could expect any but advanced students to understand.

Dr Wilson's criticism of Reid's labours leads him into a very happy popular exposition of the functions of the nervous system. He also treats the question, How far are we justified in performing experiments on the lower animals? to which he replies in the following passages:—

"Within the limits here assigned by Dr Reid, it would be folly to assert that there is any breach of the laws of God or man in subjecting animals to suffering. It would be easy to address an *argumentum ad hominem* to those unprofessional assailants of the humanity of physiologists, who have no scruple in abetting the cruelties of the ministers of the kitchen; and even the vegetarian, unless his conscience is clear of ever trapping a mouse or slaying a wasp, would come within the scope of the appeal. Only the Hindu, who builds hospitals to vermin, would be free to cast a stone at us. It is no part of my argument, however, to justify one class of cruelties by another, but only to shut the mouths of those who seat themselves on the judicial bench, when they should stand among the prisoners at the bar. The question, what is the extent of our kingdom over the lower animals, is one which must have a place in every code of natural ethics, and in every interpretation of Christian ethics, and each of us has occasion to answer it to his own conscience and to God.

"The answer of every honest respondent would include the confession that he thought himself at liberty to inflict pain (apart from that involved in slaughter for food) on the lower animals where this was essential to certain useful ends. The universal practice of mankind shows this. Leaving altogether aside every branch of sporting, which finds its only justification in the health, the courage, the endurance, and other manly qualities which it begets in the sportsman; and likewise all the subjugation to unnatural confinement of wild animals not susceptible of domestication, which fancy or popular science fosters; and still more the employment of the beasts of the field in war:—the point may safely be rested on the liberty which every one would feel to shut the gates of mercy when urging a horse, though he were the most noble, faithful, and generous of steeds, on an errand of life or death.

"None but a madman would spare the animal that carried to a man bleeding

to death, the surgeon who could save his life ; or hesitate to urge to the uttermost the horses that were carrying the news of an invasion, or an armistice, or even that only dragged the fire-engines that might arrest a fire. It would assuredly be counted mistaken mercy, and even culpable homicide, if the bearer of a reprieve to a criminal condemned to death, arrived too late to save human suffering and life, because he lingered to lessen the sufferings of his over-driven charger. No moralist, whatever the basis of his morality, could acquit the tardy messenger on such an errand, unless he counted a beast's life of more value than a man's, and denied that animal agony was permissible even where it spared or alleviated human suffering."—Pp. 157, 158, 159.

On the other hand, no one can more strongly denounce experiments on the lower animals, when undertaken without consideration, or for mere purposes of display, than the author does at page 165 and ten following pages, a perusal of which we would especially recommend to medical students and experimental physiologists.

We have read Dr Wilson's book with unmixed gratification. A delicate subject is handled with unusual tact. The style is remarkably pleasing; and we recommend it to professional and non-professional readers, as a work, the perusal of which is calculated to produce lively interest, much instruction, and serious thought.

Traité de Médecine Pratique : Atlas de Plessimétrisme : Ouvrage indispensable pour apprendre soi-même le Plessimétrisme. Par P. A. Piorry. Paris, 1851. 8vo.

Treatise on Practical Medicine : Atlas of Plessimetry : A work indispensable for self-instruction in Plessimetry. By P. A. Piorry. Paris, 1851. 8vo.

The unceasing energy with which M. Piorry has for many years advocated the employment of mediate percussion has been often alluded to in this Journal, and we have frequently expressed our opinion, that to the labours of this accomplished physician practical medicine will for ages be largely indebted. If at the present time, and even in his own country, M. Piorry's dicta on matters relating to physical diagnosis do not meet with that ready and unreserved assent to which their enunciator obviously conceives them to be entitled, the medical profession is certainly not to blame. For in the fervour of his zeal, it is but too obvious that the inventor of the "*plaque d'ivoire*" exaggerates the utility of that peculiar mode of exploration of which he is so perfect a master, reiterating its praises with a vehemence of asseveration more calculated to engender suspicion than to disarm prejudice or remove reasonable doubts. Besides, there is a strange grotesqueness about most of M. Piorry's writings, and which is especially conspicuous in the work of which the ninth volume is now before us—a peculiarity of style, and of numerical arrangement of paragraphs, most artificial,

unimpressive, and tedious, and a perpetual recurrence of truly horrible cacophonies, resulting from the systematic attempt to torture the language of Homer into an "onomapathologisme," or pathological nomenclature. If M. Piorry would only discard this hideous jargon, which he alone of all physicians in Europe employs, and would lay the results of his vast experience in plessimetry before the world in a readable form, no doubt his labours would meet with more general appreciation; but so long as plessimetry and onomapathologism are condemned to be coupled together, so long as the "Traité de Médecine" wears the mixed aspect of a Greek lexicon and an auctioneer's catalogue, there will be considerable difficulty in separating the ore from the dross, and the author will not receive all the credit which his ingenuity and perseverance so well deserve.

The "Atlas de Plessimétrisme" contains forty-two wood-cuts or diagrams, by means of which ideas of the position of the viscera as illustrated by the use of the plessimeter, are very clearly conveyed. Different gradations of dulness and resistance are indicated by varied shades of blackness; and as these delineations include examples of all the diseases in which percussion is applicable as a means of diagnosis, their study is calculated to assist those who wish to attain the required dexterity in plessimetry. But there are among these wood-cuts some examples of over-refinement on the part of the author, or at least of the introduction of details which, however valuable in his opinion, will appear to the majority of his readers simply ludicrous. Thus, in plate 29, the dulness due to a hypertrophied thyroid gland is depicted, and in the accompanying commentary is thus described:—

"12647. 1°. Circumscribed dulness due to the presence of hypertrophied thyroid body—a dulness which differs in character from that proper to the muscles and bones of the neck. At the centre of the space which it occupies, there is discovered a sonoriety and elasticity which permit the limitation of the larynx and trachea, and the determination of their size. When the thyroid body is prolonged more deeply downwards into the thorax, the extension of the dulness, which is proper to it, points out this fact, and permits the determination of the degree of *mégalie* (size, augmented volume) of the thyroid body."—P. 63.

Again, in explanation of parts of figure 38, we find the following:—

"12701. No. 1. Dulness, resistance to the finger, dryness of sound, existing in a space distinctly limited, projecting on the right side of the cervical region, and connected with a *rachisocélie* (No. 12497), and most frequently with a *rachisophymie* (No. 12496)."—P. 79.

"12706. No. 7. Dulness deep and often very marked, brought out by deep percussion, practised over the external iliac fossa of the right side, connected with the presence of matters filling the small intestine (No. 8055), for the ileum usually corresponds to this region. It is exceedingly useful to take these plessimetric characters into account, when in *iléospilosie septicémique* (No. 7997) we desire to know what is the state of the small intestine."—P. 78.

Now, we are not singular in maintaining that passages like these are serious blemishes in a practical work. Would any surgeon, who could handle, and feel, and see, seriously occupy himself in percussing a bronchocele, in order to ascertain its size and connections? or would he resort to the same mode of exploration, in order to detect enlargement of the vertebral column in the neck, with or without tubercular deposit? And what would a patient think of the physician who should violently percute the right half of his posteriors, in order to elicit information regarding the contents of his small guts? What do our readers think of *mégalie*, and *rachisocélie*, and *rachisophymie*, as substitutes for the terms *size, tumour of the vertebræ*, and *tubercle of the vertebræ?* And could any one of them have guessed the true onomapathologismatical signification of *iléospilosie septicêmique* to be *typhoid fever?* which, with some hesitation, we express our belief that it is.

We find illustrations of the author's mode of ascertaining the position of the fœtus in utero by percussion,—a species of manipulation in this case hardly justifiable, even were its results free from fallacy.

Many allusions are likewise made to the all but exploded doctrine, which necessarily connects intermittent fever with enlargement of the spleen, and to which M. Piorry still clings with extreme tenacity.

For mapping out the regions and the limits of viscera on the surface of the body, M. Piorry recommends a pencil of soft plumbago which has been steeped for two months in oil; and we are assured by some of our young Edinburgh graduates, who have followed the *Cliniques* at La Pitié and La Charitié, that for hospital use this pencil is very well adapted. To make the marks durable, the outline traced with the black lead must be lightly and rapidly touched with moistened nitrate of silver, and then dried. M. Hutin, a pupil of M. Piorry, has invented another mode of staining the skin without risk of producing excoriation. He has a kind of pencil, consisting of a glass tube filled with solution of chloride of gold and platinum; and a brush of asbestos, moistened with this fluid, serves to mark out the parts which it is wished to stain permanently. The tracings are at first yellow, but finally become of a violet hue. M. Piorry would prefer this mode to all others, if it did not require the use of an additional instrument.

If a considerable amount of exuberant details were abstracted from M. Piorry's "Atlas," and the meaning of the remainder expressed in language more generally intelligible, the work would become one of great value, especially to clinical students. We hope ere long to hail its appearance in an English dress; for M. Piorry's prepossession in favour of his own method and nomenclature forbids the hope that we shall ever see much improvement in future French editions.

Part Third.

HOSPITAL REPORTS.

FIRST REPORT OF THE DEPARTMENT OF PATHOLOGICAL ANATOMY IN THE ROYAL INFIRMARY OF EDINBURGH. SESSION 1851-2.

Edited by W. T. Gairdner, M.D., *Superintendent of Pathological Anatomy; assisted by* James Drummond, James C. Howden, *and* John Chisholm, *Students of Medicine.*

The following report is the result of a conviction, which has impressed itself on the present Superintendent of morbid anatomy ever since he commenced his duties in the Royal Infirmary of Edinburgh, that the records of that department comprise a body of facts of such intrinsic value as to deserve being communicated to the public in a more complete form than has been hitherto attempted. It was thought that, by an occasional publication of the more valuable portion of the observations, the interests of medical science might be promoted, while the instruction in this school would receive a special stimulus from the preservation to the student, in a permanent form, of some of the lessons recorded from facts under his own observation. The multitude of details, however, accumulating from day to day, and the necessarily common-place character of many of these, made it unadvisable to submit them to the public without considerable additional labour in the way of condensation and analysis; and the amount of routine work devolving upon the comparatively few labourers in this department of hospital duty has, up to a late period, rendered impossible the execution of the original design. By means of very considerable exertions on the part of all concerned, these obstacles have at length been overcome; and in publishing a first report of this department, Dr Gairdner has to thank his present staff of zealous and able assistants for an amount of active and intelligent co-operation which he has not before enjoyed, but which, it is to be hoped, the increasing attention devoted to pathological anatomy in this school will tend to place every day more within reach. Should he not be disappointed in this hope, it is intended that other reports shall from time to time follow, in which (possibly without adhering very closely to a uniform plan) the information resulting from the researches carried on in the theatre of this hospital into the anatomy, chemistry, and general laws of disease, may be collected in an accessible and useful form; and as these publications will be valuable exactly in proportion to the amount and value of the independent labours of which they are the expression, it is to be hoped that every successive report will become more worthy of the institution and of the school from which it emanates. Meanwhile, it has been thought desirable to make at least one attempt to convey a consistent and moderately complete idea of the labours of a certain portion of the session just concluded to a wider circle than those immediately concerned in them.

The present report contains, firstly, an abstract of the dissections during four months of last winter; and, secondly, various documents, analysing, illustrating, and facilitating reference to the facts contained in the more full account of these dissections in the Pathological Register of the Infirmary. It only remains to say, that Dr Gairdner is generally responsible for the statements which are not specially authenticated; but that all important investigations, and especially all

original statements depending upon individual authority, are distinguished by the name of the observer or author.

Edinburgh, April 23, 1852.

I.—ABSTRACT OF FATAL CASES EXAMINED IN THE ROYAL INFIRMARY OF EDINBURGH, FROM OCTOBER 28TH, 1851, TO FEBRUARY 28TH, 1852.—(*Pathological Register*, Vol. XIV.)

1.—A woman, aged 18. Caries of last dorsal and first lumbar vertebræ. The sinus, in connection with the carious bones, passed along the right psoas muscle, dissecting its fibres, passing over the hip-joint, and opening externally beneath the great trochanter, on the outside of the thigh. The upper part of the femur was laid bare between the trochanters; the hip-joint contained pus, and the articular cartilage was eroded at the circumference, the round ligament being also much softened. Great emaciation. Waxy liver and spleen. Heart atrophied, weighing only five ounces. The patient died of simple exhaustion, from the long-continued discharge of pus.

2.—A man, aged 69. Oblique fracture of femur, partially repaired by callus. Very extensive bed-sores. The man died from exhaustion by delirium tremens, followed by sloughing of the nates. The femur was dissected by Mr Bickersteth, surgical clerk, who observed that one of the perforating arteries which entered the callus was very much enlarged, and its walls contained much calcareous matter. The femoral artery was slightly atheromatous. Internal organs not examined.

3.—A female, aged 41. General dropsy, with albuminuria (which, however, was not constant), ascites and hydrothorax, supervening on long-continued bronchitis and emphysema, with hypertrophy of the right side of the heart. Obsolete tubercular deposit, with extensive atrophy at the apices of both lungs; marked emphysema of their anterior portions. Kidneys slightly and irregularly congested; the cortical substance otherwise of normal character and consistence. Microscopically nothing abnormal, except that the epithelium was perhaps a little irregular, and contained here and there a few small (oleo-albuminous) granules. Considerable fibrous tumours, and some mucous polypi, of uterus.

4.—A boy, aged 6½ years. General dropsy after scarlatina. Urine not albuminous, while the patient was under observation during life. Death by bronchitis and asthenia. Kidneys strictly normal to the naked eye; examined microscopically, showed the epithelium rather crowded and irregular, but generally not far from normal. The only decidedly abnormal appearance was that of a number of clear hyaline vesicles ("soap-bubble vesicles") in the fluid scraped from the cortical substance.

5.—A man, aged 48. Very much emaciated and sallow. Cancer of pylorus; incipient cancer of liver; secondary abscesses in lungs. Illness of twenty-one months' duration.

Description of Pylorus, &c.—(The preparation is preserved in the University Museum.)—"The pyloric end of the stomach was found to be considerably narrowed, and very much thickened; an irregular fungating ulcer, with thick edges and base, had completely removed every vestige of the pylorus, and appeared to extend from it both upwards and downwards, but chiefly in the former direction; breadth two to three inches; it passed all round the alimentary canal. At the cardiac end of the stomach a single lymphatic gland converted into calcareous matter, size of a cherry stone. The stomach at this part and the œsophagus normal."

6.—A man, aged 29. Tubercular disease of lungs, intestines, and mesenteric glands. Miliary tubercles of kidney. Waxy liver (weighed five pounds, congested, specific gravity 1055).[1] Fistula in ano (three years); symptoms of phthisis (eight months).

[1] It is right to state the method in which the specific gravity of organs is ascertained in the cases here mentioned. It is one which I have been in the habit of employing for some time; and although it has no pretensions to absolute exactness,

Analysis of Liver by Mr Drummond.—Water, 63·2 per cent.; solids (including fat), 35·8; fatty matter removed by ether, 4·8.

7.—A woman, aged 74. Hemorrhagic apoplexy. A recent clot, size of a hen's egg, in posterior lobe of left hemisphere; cerebral substance broken up into the corresponding ventricle. In right hemisphere an orange-coloured cicatrix and cavity in the cerebral substance, extending from the surface to the ventricle, the serous membrane of which was entire, and adherent to the choroid plexus opposite the cicatrix. (Coloured drawings in Dr Gairdner's collection.) Arteries of brain atheromatous. Head only examined. A second or third apoplectic attack, attended by stupor for about a week; imperfect recovery, relapse, and fatal coma.

8.—A man, aged 50. Purulent infiltration of cerebral and spinal pia mater, with pus in the ventricles of the brain. Slight œdema of lungs, with muco-purulent effusion in the bronchi. Symptoms—frequent strong pulse, foul tongue, typhomania, suffusion of eyes, and flushing, following lancinating pain in the head of several weeks duration; death by coma.

9.—A man, aged 27. Tubercle in very various stages in lungs; partially cicatrised cavities; pulmonary atrophy and emphysema; tubercular ulceration of intestines. Symptoms—hæmoptysis, and all the usual phenomena of phthisis, ascribed to an injury of the chest. Duration of disease ten months.

10.—A man, aged 60. Bronchitis and emphysema, with hypertrophy of right side of heart. Obsolete tubercle? of lungs (calcareous and miliary deposits, with atrophy and induration). Died comatose. Brain normal.

11.—A man, aged 40. Aneurism of the aorta, involving the left recurrent nerve, and in contact with the mucous membrane of trachea. Death from laryngeal dyspnœa, for which tracheotomy was performed when the patient was *in articulo mortis* (he was only a few hours under observation, and the case was supposed to be one of laryngitis).

Description of Aneurism, &c.—(The preparation is preserved in the University Museum.)—"The thoracic viscera being removed *en masse*, together with the larynx, trachea, pharynx, œsophagus, and vessels, a small amount of ecchymosis is observed in the cellular tissue of the posterior mediastinum. Œsophagus, and pharynx normal; but one or two lymphatic glands, about two inches above the cardia, are enlarged to the size of almonds, and contain some curdy deposit. Larynx and epiglottis normal.

"Several rings of the trachea divided perpendicularly in the mesial line in the usual position of the operation of tracheotomy. Some congestion of the mucous membrane in the upper part, increasing downwards. In its lower third the congestion is of deep purple colour; and about two inches above the bifurcation,

it is, I think, well adapted for most purposes of the morbid anatomist, and calculated to enable him, with comparatively little loss of time, to ascertain a number of most valuable facts. I employ a very strong solution of common salt, which may readily be procured, having a specific gravity about 1200, and therefore much denser than any of the softer tissues of the human body. By placing the tissue to be examined in this solution, and very carefully adding water until the solid mass is accurately balanced in the fluid, the specific gravity may be estimated from that of the latter in the ordinary way, either by the density beads or a graduated gravimeter. Care must be taken to produce an accurately homogeneous mixture of the added fluid, and also to avoid the presence of air-bubbles, which are apt to adhere to the tissue, and diminish its apparent density. But with these precautions, all the exactness which is necessary for most anatomical purposes may be attained. It is only necessary to add, that in estimating the specific gravity of the liver or kidney, I take a small portion of the internal glandular substance (in the kidney, invariably the cortical substance); in the heart, a portion of the muscular tissue, without either tendon or fat, generally from the interior of the septum ventriculorum. The results of my observations, to which I shall afterwards refer in the case of the liver and kidney, justify me in strongly recommending to morbid anatomists a more frequent reference than is usual to the specific gravity of the solid parts of the body in their descriptions of them.—W. T. G.

there is a transversely oval protrusion of the mucous membrane on the anterior surface, of a somewhat livid colour, covered with an ash-gray or greenish coating of epithelium. In the middle of this protrusion (which is a quarter of an inch by one inch diameter), can be observed, on careful examination, a minute superficially ulcerated point, with a deep purple base, and surrounded by deeply congested membrane. Beneath the large protrusion are two or three yellowish slightly elevated points, surrounded by deep livid congestion, and bearing some resemblance to minute ecchymatous pustules. There is also another minute point, at which the mucous membrane is apparently so thin as to be transparent, being at the same time of a very deep purple colour, and giving the appearance of a purple vesicle, which becomes protruded when pressure is made on the surrounding parts of the membrane. No complete perforation of the mucous membrane at any point can be ascertained. (Coloured sketch of these appearances in Dr Gairdner's collection.)

"The aorta being carefully opened on its anterior surface, displays the internal membrane irregularly thickened, opaque, and deficient in firmness to the touch, but containing no calcareous matter, nor any very distinctly marked abnormal deposit to the naked eye. At the back part of the arch, immediately below and between the right and left great vessels, there is a transversely oval opening through the wall of the aorta, about three quarters of an inch in diameter, and with smooth and rather sharp edges. This opening leads into an aneurismal sac, about the size of a 'magnum' plum, which extends backwards to the trachea at the protrusion above described, and upwards and backwards behind the innominata and left carotid; its upper point, where it is united to the rings of the trachea, nearly corresponding in position with the level of the jugular fossa.

"On passing the finger into the sac, which contains a very small amount of coagulum, it can be felt to be moderately thick and strong on all sides, except at two places,—one of these is the protrusion of the tracheal mucous membrane, where an opening has taken place between two of the tracheal rings, by absorption of the fibres connecting them, and the mucous membrane forms the wall of the aneurismal sac; the cartilaginous rings at these points are laid bare. The other part, where the wall of the sac is quite thin and membranous, is at its left side at the upper aspect, over a circular space of about three quarters of an inch in diameter.

"On careful dissection of the structures about the sac, the recurrent nerve of the left side is found to be the only one materially compressed by it. In passing upwards from beneath the arch, this nerve is closely in contact with the left wall of the aneurism, being imbedded in its indurated fibrous tissue, in the midst of which it almost ceases to be traceable further. The right recurrent is normal. The arch of the aorta is very slightly and generally dilated; the vessels which are given off from it normal in size. The heart (scarcely larger than natural, considering the size and robustness of the individual), weighs thirteen ounces; its valves and orifices normal. The lungs congested posteriorly; the larger bronchi containing a quantity of quite recent semi-coagulated blood (probably from the operation of tracheotomy); otherwise the lungs normal, not collapsed, or emphysematous."

12.—A man, aged 24. Erysipelas of scalp and face after typhus fever, followed by typhoid coma and death. Subarachnoid serum of brain rather in excess, but no other lesion of importance. Lobular hepatisation of the lungs, with pus in bronchi, and incipient bronchial abscesses.

13.—A woman, aged 43. Colourless softening of the brain over a large portion of right hemisphere, and in the diverging fibres of the right optic thalamus and corpus striatum. The arteries at the base normal. Death by coma and asthenia. Considerable pulmonary collapse, and muco-purulent effusion in the bronchi.

Description of Cerebral Softenings.—(Coloured drawing in Dr Gairdner's collection.)—"Both softenings have exactly the colour of the surrounding parts; the softest portions are perfectly fluid and opaque; these being washed away by

a gentle stream of water, leave the cerebral substance irregularly excavated and pulpy for some distance around. In the larger softening, the nervous matter does not assume quite its normal character up to the border of the gray matter, which, however, is nearly normal. The change of structure is so perfectly gradual, that the eye cannot distinguish any exact limit of the softened portion.

"On submitting portions of the softenings to the microscope, they are found to contain abundance of granular corpuscles, free granules, and many 'hyaline vesicles.' The arteries of the pia mater generally seem normal to the naked eye. The finer vessels carefully examined by the microscope show only very few minute fatty granules in the walls, and may be considered almost normal. The vessels in the softened portion are mostly thickly coated externally with granular matter, which, however, can be separated pretty readily by washing."

14.—A woman, aged 30. General dropsy, ascites, double hydrothorax. Death by compression of the lungs and asphyxia. Slight hypertrophy of the right side of the heart, which weighed ten and a half ounces. Liver congested, otherwise normal, weighing five pounds. Kidneys normal, with the exception of a very little granular matter in the epithelium; weight of both kidneys twelve ounces (urine scanty, non-albuminous). Right ovary formed a fibrous tumour, weighing three pounds one ounce, and having a cyst, the size of a large plum, in its interior. Symptoms—ascites followed by anasarca and progressive dyspnœa. After treatment by diuretics without effect, tapping of abdomen performed, with only temporary relief. Duration of disease upwards of four months.

Description of Ovarian Tumour.—(Preparation in the University Museum.) —"The internal structure of the tumour is very like that of the ovary in a female within the child-bearing period, only that there are no Graafian vesicles. The vascular arrangement is that of irregularly disposed, sometimes radiating vessels, in all parts of the tumour, and apparently rapidly breaking up into a capillary network. The intervascular structure is mostly homogenous, light coloured, and tears up like a very finely fibrous tissue, having none of the bold white fibres seen in the uterine fibrous tumour. In many the fibres have a somewhat lax disposition, and are separated by a large amount of infiltrated serum. Other portions of the tissue are more dense than the mass, and these are proportionally less vascular, and of a white opaque appearance. At one or two points traces can be seen of a puckered circular membrane, strongly resembling the cicatrices sometimes left by small ruptured Graafian vesicles, which have not formed *corpora lutea.* At one or two points also were traces of ecchymosis.

"A section of the tumour examined microscopically, shows it to be composed almost entirely of fine fibres, like those of recent adhesions or lymph, enclosing scarcely any complete cells, but revealing, on the addition of acetic acid, a multitude of irregularly disposed nuclei, of angular or roundish form, and having much the same general size and aspect as the corpuscles commonly found in tubercle,—viz., diameter on an average $\frac{1}{240}$ to $\frac{1}{180}$ of a line, edge distinct and tolerably smooth, and contents a few minute granules; colour faint yellowish. These nuclei could in many instances be distinctly separated or washed out from the midst of the fibres, in which were imbedded other but fewer nuclei of the usual elongated oval type, as found in fibrous tissue. The fibres appeared to be connected together by shreds of very delicate colourless membrane, nearly homogeneous, except from minute dark granules, which were sprinkled plentifully over the field, both free and attached to the structures. Many of the nuclei, when washed out from the fibres, showed shreds of irregular adhering membrane, also granular, but nowhere assuming the form of perfect cells."

15.—A man, aged 49. Extensive infiltration of urine following stricture of the urethra with perineal fistula. Sloughing of the cellular tissue around the bladder and rectum, and also of the nates; rupture of the urethra. (The pelvis only examined).

16.—A girl, aged 13. No marks of puberty. A tumour, size of a walnut, in the right lobe of the cerebellum, obliterating its central gray matter, and in contact with the distal end of the crus cerebelli; considerable serous effusion

in ventricles (℥xx.), the whole, except the last drops, nearly as limpid as distilled water. No effusion at base of brain, nor around the choroid plexus and velum interpositum. A few minute miliary tubercles in the lungs; bronchial glands containing a considerable quantity of miliary and yellow tubercle. Subject from the age of eight to tremors and giddiness, with imperfect vision. Two months before death, headach and weakness of the limbs, followed by fever, vomiting, dilated pupils, &c. Death by coma.

Description of the Tumour of Cerebellum.—(Coloured drawings in Dr Gairdner's collection.)—"The tumour, which was separated by no distinct line from the cerebral substance, had a consistence somewhat greater than very thick starch, and somewhat of its semi-transparent appearance. Its colour was pearly white, with a pinkish tinge, which, on examination with low magnifying powers, resolved itself into an immense number of exceedingly fine vessels, dispersed throughout every part of the morbid mass. The pearly appearance of the tumour was further modified by the presence of exceedingly minute disseminated opaque granulations, scarcely visible except with a lens, irregular in form, and without distinct edge. These granulations were so opaque as to conceal the vessels, while the more transparent parts of the tumour allowed them to be traced for some distance beneath the surface. On examination with higher powers (240 diameters) the starch-like matter of the tumour appears mainly made up of delicate corpuscles, the size of pus globules, but undergoing little change on the application of acetic acid. In other respects these resemble pus globules, except that they are flatter, and less distinct in their edge. In the midst of these are rarer but still numerous corpuscles, of larger size, up to $\frac{1}{80}$th of a line; some of them nucleated, others completely filled and obscured with granules, and showing all the usual forms of the so-called granular corpuscle as found in the brain."

Measurements.—Thymus gland of considerable size, weighing 350 grains; vertical diameter, three inches; horizontal, four inches; length of uterus, one and a half inch; breadth at fundus, half an inch; in middle, three-eighths of an inch; at os, half an inch; extreme antero-posterior diameter, one-fifth of an inch; ovaries of exactly equal dimensions; length, one inch; breadth, three-eighths of an inch; thickness, one quarter of an inch.

Weights of Organs.—Brain, forty-three ounces; heart, five and a half ounces; right lung, eight and a half ounces; left, six ounces; liver, two and a half pounds; kidneys together weighed seven ounces.

17.—A woman, aged 40. Tubercle of lungs and intestines. Fatty degeneration of liver; weight seven pounds, sp. gr. 1045. Atrophy of left kidney from calculus. (This kidney is described in the proceedings of the Medico-Chirurgical Society; see Monthly Journal for February 1852, p. 177.) Case presented no peculiar features.

18.—A woman, aged 50. Died of fever. All the organs normal, except the lungs and uterine organs. The former presenting chronic emphysema and atrophy; the latter adhesions of the Fallopian tubes and ovaries, and considerable lateral deviation of the uterus. (Fundus to the right side, and backwards.)

19.—A man, aged 23. Died of typhus fever. Chronic and mostly retrogade tubercle of the lungs. "Upper lobes of both lungs crowded with miliary tubercles; and lower lobes also contain similar tubercles, though in less quantity. Near the apex of the left lung, a cavity, capable of containing a walnut, containing pus, and lined by a membrane. At the apex of right lung several small yellow encysted masses the size of a pea, and one cavity capable of containing a cherry."

A few small miliary tubercles of kidney and liver. A slight superficial erosion in the duodenum (hemorrhagic erosion, *Cruveilhier*). In the lower twelve inches of ileum, several submucous tubercles, not ulcerated; and in the cæcum one or two small oval or linear ulcerations, with raised livid edges somewhat indurated. The typhus fever was in this case well marked, attended with eruption, and of the ordinary type. The relatives (brother, etc.), who were present at the dissection,

stated most positively that he was never known to them to have the slightest disease or weakness of the chest, and was always able for his usual employment, which was that of a sweep.

20.—A woman, age stated 21, but apparently some years older. Bronchitis, with collapse, and incipient partial gangrene of lungs. Lungs exceedingly œdematous posteriorly, rather deeply congested, tissue friable, and fetid. Anterior part of lungs considerably emphysematous. Bronchi much loaded with mucopurulent matter. Bronchial glands enlarged and friable, some of them containing old chalky deposits. Other organs normal. Died from asphyxia; symptoms of several years' standing, with exacerbation two months before death; disease was attended by hæmoptysis, but in what quantity not stated.

21.—A man, aged 18. Very much emaciated; diabetes mellitus, symptoms of three months' standing. About half a pint of fluid in either pleura, with soft portions of yellowish lymph; incipient multiple abscesses of lung, precisely similar to those found in purulent infection. Two ounces of fluid in pericardium, with a small stringy mass of soft lymph. All the other organs normal, except perhaps the kidneys, which were simply enlarged by about one-third, and the pancreas, which was rather smaller than natural in relation to the other organs (weight 962 grains), but without disease of structure. (The intestinal contents, blood and urine, in this case were analysed by Mr Drummond. See proceedings of the Physiological Society, in Monthly Journal for March 1852, p. 281).

22.—A woman, age stated 20, apparent age about 25. Empyema, with perforation of pulmonary pleura. In left pleura about one quart of pure pus, slightly fetid. The lung completely carnified and compressed to its root, but otherwise normal. The costal and pulmonary pleura coated with a thin layer of yellow lymph. The heart not displaced. Pericardium contained a little fluid and floating lymph, and had a considerable coating of soft yellow lymph on the left auricle and ventricle.

Description of Empyema.—" The carnified lung being removed (for more careful examination) was found to contain absolutely no air and little blood, and to be reduced to about one-fourth of its natural size. At the posterior portion of the lower lobe is an oval perforation of the pleura, one-half by one-quarter inch diameter, with edges tolerably smooth and even, coated with lymph more opaque than that covering rest of the pleura, but not at all elevated, being in fact obliquely bevelled off into a depressed cavity several lines in depth. This cavity is scooped out in the carnified pulmonary tissue, and contains a very dark-coloured fetid and friable slough of a small portion of lung and pleura, adherent by a very few softened fibres to the margins of the perforation.

" There was probably a small quantity of air in the pleura, but particular observations were not made on this point."

23.—A man, aged 24. Tubercle of lungs and intestines. Excavations of lung, with perforation of pleura on right side, and pneumo-thorax. Symptoms of three months' duration; four days before death intense pain of thorax and dyspnœa, with signs of pneumo-thorax; decubitus on the *sound* side; no abatement of pain till death, which took place from collapse with continued dyspnœa.

Description of Tubercular Pneumothorax.—" The right pleura, on being opened, manifestly had contained a great deal of air, and presented a large sac, nearly empty of fluid, the lung being compressed into the back and upper part of the thorax.

" The upper lobe of the right lung was attached to the external thoracic wall by several firm fibrous adhesions, which, planted by a broad base at either end, were drawn out thinner in the middle, and had apparently exerted traction upon the lung at the points of attachment to it, which formed well-marked conical processes projecting towards the pleural cavity.

" The lung was coated with a thin layer of lymph, as also some part of the costal pleura. The pleural cavity contained not more than four ounces of fluid,

nearly transparent, with about an ounce of semi-transparent soft light-lemon-coloured lymph, apparently without pus.

"On removing the lung, the apex was found to be pretty firmly adherent at one or two points; but between these adhesions and the stretched ones already mentioned there were two openings in the pleura about three-eighths of an inch in diameter, and with tolerably smooth rounded edges, covered by lymph. The lips of these openings were neither depressed nor elevated above the rest of the pleura. On cutting into the lung, several irregular excavations were found in the upper lobe, communicating with the perforations above-mentioned; and in both upper and lower lobes smaller excavations (size of a bean), filled with pus, and lined by distinct firm membrane; together with several masses of yellowish matter, tolerably friable, and distinctly encysted.

"The left lung generally crepitating, but containing condensed nodules, which on section showed in some parts ulcerated excavations, up to the size of a wild cherry, lined with a soft flocculent membrane; at other places only a darkish gray-coloured condensation, surrounded by an ecchymotic or congested ring. Scarcely any distinct appearance of tubercles in this lung, but at one point of surface a calcareous concretion, not larger than a barley-corn.

24.—A very robust man, aged 30. Fracture of cervical vertebræ, the result of a fall. Compression of spinal cord. Death about twenty hours after the accident, by asphyxia.

25.—A woman, aged 40. Hepatisation of almost the entire lower lobe of the left lung, with lymph in the corresponding pleura. Upper lobe of left and the whole of right lung normal. Right lung, 15½ ounces; left lung, 45 ounces. Distension, and very slight hypertrophy of right side of heart. Incipient granulations of kidneys. Phenomena, apparently of menstruation, in the uterus and ovaries—three recent corpora lutea.

26.—A man, aged 38. Fever; bronchitis; chronic atrophy, and recent collapse of lung, with incipient emphysema.

27.—A woman, aged 24. Tubercle of lungs, with some emphysema. Slight tubercular ulceration of intestines. Other organs mostly normal.

28.—A woman, aged 25. Tubercle of lungs, with contracting cavities, atrophy, induration, and emphysema. Hypertrophy of right ventricle of heart (thickness three-tenths to four-tenths of an inch). A single ulcer in intestines. Abnormally dense liver and kidneys; firm spleen; slight external œdema.

29.—A man, aged 38. Caries of all the dorsal vertebræ; psoas abscess on both sides, opening on the left side at the outer aspect of the thigh, four or five inches below the anterior superior spine of the ileum. Multiple abscesses, with incipient gangrene of both lungs, recent lymph in both pleuræ, moderately soft adhesions of pericardium, one-eighth of an inch in thickness. Small concretions in Peyer's patches, and in the splenic chain of lymphatic glands. No tubercle in lungs. Duration of symptoms two years. Three weeks before death chest symptoms supervened. Friction murmur in pericardium discovered seven days before death; it disappeared two days before death, and at the same time increase of cardiac dulness observed (?)

30.—A man, aged 31. Internal abscesses of brain and cerebellum. A small abscess (size of a hazel nut) in the liver; in the neighbourhood of which, immediately beneath the peritoneum, and on the under surface of the organ, was a portion of a fish-bone, about two inches in length, and of the thickness of the ribs of a cod-fish. In the duodenum was found a small cicatrised spot, which appeared to indicate the point of perforation of the foreign body. The man received an injury of the head seven years before death. Two years before death severe epigastric and hypochondriac pain. Three months before death jaundice; and some weeks afterwards rigors, and acute pains in the head, followed by loss of locomotive power, but no distinct paralysis. Death apparently by sinking, without any decided coma.

31.—A man, aged 28. Tubercle of lungs with excavations. Tubercular ulcers

of intestines. Symptoms of rapid pulmonary phthisis, of three or four months' duration. Much diarrhœa.

32.—A man, aged 28. Enormous dilatation of both auricles of the heart, especially the left; slight rigidity of mitral valve; œdema of lungs; incipient granular liver. Death from peritonitis. The left auricle was capable of containing a moderate-sized cocoa-nut; the right auricle would have held a billiard-ball; walls of both auricles a little hypertrophied. Ventricles nearly normal. The action of the heart was ascertained to be exceedingly tumultuous, and accompanied by pain in the left side of thorax. Sounds not particularly noted. (Preparation in University Museum.)

33.—A man, aged 39. Tubercular excavations of lungs, and ulcers of intestines. Waxy liver, sp. gr. 1061, weight four pounds. Enlarged firm spleen, sp. gr. 1066, weight twelve ounces. Advanced Bright's disease of kidneys, sp. gr. 1054, weight of both fourteen ounces. A pensioner, who had been in the Indian service, and had suffered from ague and several attacks of diarrhœa, as well as from primary, and probably secondary, syphilis. Phthisical symptoms of doubtful duration, but of considerable standing; urine of excessively low specific gravity (1004-6), and albuminous. Died exhausted by diarrhœa.

34.—A man, aged 42, but apparently several years younger. Typhus fever. Softened spleen. Death from broncho-pneumonia.

35.—A woman, aged 34. Aneurism of aorta bursting into the left pleura, in which was a quantity of fluid blood, with a recent coagulum of two pounds weight.

Description of Aneurism, etc.—"The aorta at its origin not dilated. The tumour in close relation with the pericardium at its reflexion to the left of the great vessels, and apparently involving the greater part of the transverse aorta, and the ascending aorta internal to the pericardium. Size of tumour, that of a small cocoa-nut; its walls rather flaccid, and not at all distended. Dimensions (not exactly ascertained),—about four inches horizontal, three vertical, three antero-posterior. Relations—superiorly, with roof of chest, and first rib, which is eroded on inner surface; anteriorly, with ribs first and second, part of second intercostal space, left half of manubrium; posteriorly, with corresponding ribs, vertebræ, part of lung, posterior mediastinum, arch of aorta; to right, with arch of aorta, pericardium, pulmonary artery; to left, with lung and first rib; inferiorly, with lung and pleura of left side, with some of the bronchi of upper lobe, with left division of pulmonary artery, and with the extravasated blood. On removing the thoracic organs *en masse*, the aperture of extravasation, small and valve-like, admitting an ordinary director, and surrounded by a few small granulations on pleura, was found near its anterior reflexion from the great bronchi on the upper lobe of the left lung."

Symptoms.—Lancinating pains in the upper and left front of chest, shoulder, and left arm; slight dyspnœa and dysphagia; absence of pulse in left wrist; dulness on percussion over the tumour, with faint systolic murmur, and increased second sound. Death by syncope lasting about one hour.

36.—A man, aged 24. Chronic tubercle, with excavation of lungs and ulceration of intestines. Death from secondary bronchitis and emphysema.

37.—A sailor lad, aged 21. Arrived at Leith four days before death from typhus abdominalis; atonic ulcers (Rokitansky) of Peyer's patches; perforation of jejunum; peritonitis.

38.—A man, aged 21. Hemorrhagic softening of cerebral hemispheres superficially. Hemorrhage in the velum interpositum, and softening of the corresponding point of the under surface of fornix. Infiltration of pia mater at base of brain, with granular (tubercular?) lymph. No atheroma of arteries. Incipient tuberculisation of lungs, pleura, and intestines.

Symptoms closely resembled typhus fever. Death by convulsions and coma.

39.—A man, aged 45. Sloughing abscess in the neighbourhood of the pharynx after an injury. Death by hemorrhage into mouth and air-passages, from secondary ulceration into lingual artery.

40.—A woman, aged 47. Typhus fever and bronchitis, fatal by coma; slight chronic opacity of arachnoid, with excess of sub-arachnoid effusion.

41.—A man, aged 36—apparently considerably older. General anasarca. One and a half pints fluid in either pleura; several pints in peritoneum; œdema of both lungs. Kidneys weighing 10 ounces, pale, with petechiæ on surface, and incipient granulations of Bright. A small cyst in the liver, containing cholesterin. No history.

42.—A man, aged 56; very exsanguine and anasarcous; not emaciated; half-a-gallon of fluid in the right pleura, and universal adhesions of left; œdema of lungs; dilatation and hypertrophy of heart, with thickening of mitral valve; universal firm adhesions of the pericardium, about three-eighths of an inch in thickness.

43.—A man, aged 26; not emaciated. A cavity, size of a walnut, in the apex of right lung, with much surrounding induration and external puckering; traces of obsolete tubercle. Left lung normal, except posterior collapse; incipient tubercles in kidneys. Enlargement of testicle, with tubercular abscesses. Death sudden, with convulsions and other cerebral symptoms. No lesion of brain, except a few granulations on the peduncles of pineal gland.

44.—A man, aged 39. Peritonitis, with perforation of lower end of ileum from typhoid ulcers; several patches of Peyer ulcerated. "The perforating ulcer, the largest, about the size of a threepenny piece, is situate about three feet above the ileo-cœcal valve. Edges rather tumid and irregular, not much injected; floor of a greenish ochre colour, flocculent and soft. The peritoneal edge of the perforation, which is not larger than a quarter of an inch in diameter, is somewhat thickened, and internally lined with a layer of yellow opaque lymph, about one line in thickness. Most of the other ulcers more or less purplish or slate-coloured in edges, which are more or less tumid. "Floor of most of the ulcers clean, and not extending beyond sub-mucous tissue. In cœcum one or two small points of ulceration, marked by whitish soft opacities, surrounded by tumid mucous membrane. Solitary and aggregated glands, where remaining, not much tumified, and nearly normal. Mesenteric glands not enlarged to any appreciable extent." Symptoms on admission those of acute peritonitis. Died two days after admission.

45.—A man, aged 20—apparently about 25. Tubercle of lungs and intestines. Empyema of left side, which contained about one pint of turbid fluid. Disease lasted five months.

46.—A woman, aged 40. Purpura spots on various parts of the body, especially on the hands, fore-arms, and knees. Cicatrices of ulcers on the right leg. Slight emaciation. Miliary tubercles of both lungs, and a cavity in apex of left lung size of a walnut. Anterior borders of both lungs emphysematous. Numerous tubercular ulcers of intestines. Ulceration of both tonsils; œdema glottidis; extensive ulcerations of the mucous membrane throughout the larynx, trachea, and first bronchial divisions; the ulcers irregular in size and form; the intervening mucous membrane very deeply congested, and somewhat swollen; in the floor of the ulcers much yellowish debris mixed with pus. A portion of the cricoid cartilage laid bare over one-half inch diameter. No external appearance of syphilis (the patient was understood to have lived very intemperately.) Slight erosion of mucous membrane of os uteri. In the fundus, the mucous membrane granular and rough, with much purple coloured congestion.

47.—A man, aged 66—apparently older, from most of the teeth having dropped, and the jaws being much atrophied. Enormous gangrenous bed sores; costal cartilages only moderately ossified. Incipient gangrene at various points of the posterior part of both lungs; otherwise, organs of chest and abdomen mostly normal. Brain normal; slight rigidity of left vertebral artery; dura mater of cord in several parts somewhat thickened, and of fibro-cartilaginous consistence, not, however, materially encroaching on the calibre of the cord; a single small calcareous lamina attached to the arachnoid of the cord at its middle portion; the cord itself, both to the naked eye and the microscope, normal throughout.

Symptoms—General incomplete paralysis, with tremors, and rigidity of trunk and limbs; lethargy; occasional wandering and loss of memory; involuntary evacuations; progressive torpidity of intellect; insensibility, stupor, and death. Failure of the memory occurred thirteen months before death, since which symptoms have been progressive.

48.—A woman, aged 31. Died of typhus fever. No remarkable lesion, except softening of the spleen, and considerable collapse of the lungs.

49.—A boy, aged 15; pale and emaciated. Left pleura containing about five pints of pus slightly fetid; right pleura normal and free from adhesions. Left lung completely carnified, and compressed to about one-sixth part of the bulk of the right. Costal pleura of left side at many points softened and ulcerated by the pressure of the fluid, as also the intercostal muscles. Right lung normal; bronchi containing an excess of mucus. Pericardium containing about two ounces of serum, with a little lymph. The boy was admitted with all the symptoms of extreme empyema, some hectic fever, bronchitis, and diarrhœa (rose-coloured and capillary congestion of mucous membrane of colon). Eighty-six ounces of fluid were removed by tapping; but difficulty of breathing recurred with exhaustion.

50.—A woman, aged 22; slightly anasarcous, pale, emaciated externally, but having a considerable quantity of fat in the omentum. Tubercles of lungs and intestines, with unusually extensive ulceration of the colon. Extreme fatty liver, sp. gr. 1005. Chronic (tubercular?) abscesses in kidneys. Symptoms almost entirely dysenteric in character. Death by exhaustion.

Description of Intestinal Ulcers and Abscesses of Kidneys.—"The ulceration in the small intestines was mostly opposite the mesenteric border, in many places distinctly occupying the Peyer's patches, in others, extending from these round the intestine to three-fourths of circumference, in rings of three-fourths of an inch in breadth. These had all the usual characters of the tubercular ulcer. The edge somewhat ragged, and here and there congested purple; always somewhat elevated.

"In the great intestine, a number of ordinary tubercular ulcers, of small size, immediately below the valve, occupying three-fourths of the mucous membrane for an inch and a-half of the cœcum. The edges of mucous membrane purplish, and at a few points passing into slate colour. Below this a zone of normal mucous membrane, one-half to one and a-half inches in breadth (measured in the axis of the intestine), succeeded by a zone of greatly ulcerated membrane, six inches in breadth, in the same direction. Here the intestine much contracted, its muscular fibres highly developed; the mucous coat four-fifths destroyed, and the remaining patches of a dingy brick-red colour, approaching to purple, from capillary vascularity. This zone abruptly succeeded by another of normal mucous membrane, upwards of three inches broad; muscular coat here not contracted or thickened. Below this last zone of normal intestine, as far as the sigmoid flexure (below which intestine not examined), the colon was contracted, its muscular tissue thickened, and the mucous membrane to a very great extent removed by ulceration, which, for the most part, laid nearly bare the submucous coat, but only at one or two points, if at all, the muscular tissue. Where the mucous membrane was imperfectly destroyed it presented the appearance already indicated, of purplish, or brick-red patches irregularly disposed, sometimes abruptly limited, sometimes shading off into the pale grayish-white of the submucous tissue, which, wherever it was laid bare, presented no appearance of vascularity. Very low down in the intestine, indeed as low as removed, portions of still smooth mucous membrane could be found, of a very deep purple colour, generally of small extent, and irregularly intermixed with partially destroyed portions, from which their deeper colour, smooth surface, and fungus-like projection, distinguished them.

"Kidneys pale, division between cortical and medullary substances well marked. At the lower part of left kidney an opaque cheesy deposit, about the size of a field bean, immediately under the capsule. In right kidney an abscess in one of

the pyramids, size of cherry-stone, with flocculent false membrane, and containing a curdy atheromatous opaque debris."

Analysis of Liver by Mr Drummond.—Water, 50·3 per cent.; solids (including fat), 49·7; fatty matters removed by ether, 34·5.

51.—A man, aged 49; robust, but with little fat; hypertrophy and dilatation of heart (both sides); weight twenty ounces, with fatty degeneration of fibre. Deformity of aortic valves. Mitral valves a little rigid, not very materially deformed; atheroma of aorta; "Fatty kidney;" urine not albuminous; œdema of lungs; no external dropsy.

Description of Kidneys.—"Kidneys enlarged by about a third, weigh thirteen ounces, sp. gr. 1046. Cortical substance well injected; striæ distinct; Malpighian bodies moderately filled; no petechiæ; colour of cortical substance somewhat mottled, at points more sallow and opaque than normal; no granulations in cortical substance, but several cysts, and a few small opaque cream-coloured points. These had no definite form or outline; they were more or less rounded, readily broken down under point of knife; and when the fluid obtained from them was examined microscopically, it proved to be composed of very fine granules and molecules, with scarcely any other debris of structure. No vascularity around the opaque points. The tubes and epithelium throughout the kidney presented also a very considerable granular infiltration in some parts, such as completely to obscure the interior of the tube. No other morbid appearance.

52.—A man, aged 50. Tuberculated and atrophied liver (cirrhosis), weight thirty-two ounces. Ascites; anasarca of lower extremities; bronchitis, and œdema of lungs; kidneys normal; symptoms chiefly those of abdominal distension of seven weeks' duration. Had occasional hæmoptysis for some years, and had been long subject to cough. Urine scanty, high sp. gr., loaded with lithates.

53.—A woman, aged 38; considerably anasarcous. Slight hypertrophy and dilatation of heart, weight eleven ounces. Aortic and mitral valves a little rigid, without much deformity. Great atheroma, with incipient aneurisms of the aorta. Hydrothorax and œdema of lungs. Uterus adherent both to rectum and bladder; its fundus anteflected at an angle of about 120 degrees; mucous membrane normal; (phenomena of menstruation). Kidneys a little mottled and congested; no other morbid appearance to the naked eye; a small amount of granular matter in the epithelium, otherwise normal. Subject to palpitation and breathlessness, since an attack of rheumatism three years before death. Anasarca for six weeks. Urine scanty; slightly albuminous; density 1020.

54.—A man, aged 31, apparently a few years older. Pallid, not emaciated, with very slight œdema of feet. Advanced Bright's disease of kidneys. Death by convulsions and coma. Urea in excess in blood. Tubercles, mostly retrograde, in lungs. Tubercular ulcers of intestines. Brain normal, but yielding much urea. Symptoms almost entirely those of Bright's disease; tendency to dropsy; slight chest affection; mucous diarrhœa; finally a state approaching to typhus fever; partial recovery; successive convulsions; coma and death. Urine slightly albuminous; specific gravity 1010; at first plentiful, afterwards scanty.

Description of the Kidneys.—"Kidneys rather under the normal size, firm in consistence. The capsule moderately adherent; the venous polygons on the surface almost entirely invisible; a few stellated vessels distributed here and there forming the entire superficial vascularity. Surface uneven, marked by slight irregular depressions and flat rounded elevations.

"The cortical substance throughout pale-yellowish in colour, like the section of a pear, almost entirely destitute of vessels, and showing a considerable number of irregular specks slightly more opaque than the rest of the substance.

"The pyramids expand at their bases, and digitate irregularly into the cortical substance, which has at some parts a breadth of not more than one-sixth to one-eighth of an inch. In the substance of the pyramids several minute opaque whitish specks very distinctly visible with the naked eye, and arranged for the

most part in the axis of the pyramid. Only a few of the Malpighian bodies can be seen to contain blood.

" On microscopic examination the epithelium is seen to be irregularly developed; the Malpighian coils atrophied and thickened; the tubes in very various conditions, generally of greater firmness and consistence than usual, and at the opaque parts of the cortical substance filled with opaque granular (oleo-albuminous) deposit, which, under low powers, could be seen to follow the convolutions of the tubuli uriniferi.

" On the boundary between cortical and tubular substance there is in either kidney a small mass of opaque yellowish deposit, smooth on section, apparently structureless and of the consistence of firmly compressed curd.

" Pelvis and infundibula normal.

" In the bladder about three ounces of urine, containing a considerable quantity of albumen."

55.—A man, aged apparently about 60. Robust, pale. Was brought into the hospital dead, having dropped down suddenly in the street. Very large aneurism of ascending aorta opening into the right pleura. Extensive adhesions of pericardium. Slight hypertrophy of heart; aortic valves scarcely competent, slightly thickened; mitral also a little rigid.

Description of the Aneurism.—" Thoracic aorta excessively atheromatous throughout. On slitting open the aorta it is found that an aneurismal sac is formed by an extensive dilatation of the ascending aorta to the right, and also to the root of the neck.

" Orifice of innominata slightly dilated. Orifices of subclavian and carotid normal. Descending aorta of normal caliber; the dilated portion terminating exactly at the origin of the left subclavian artery.

" The greater part of the aneurismal sac is formed by dilatation, all the coats of the vessel being present though diseased; but at the extreme anterior part, over a space about three inches square (where it is adherent to the anterior parietes, as above mentioned), the wall of the aneurism consists in part of fibro-cellular tissue, and in part of the bones and cartilages with which it is in contact. The dilated portion of the arch is of a size easily to contain the closed fist of a large hand. The part of the aorta within the pericardium is only slightly dilated."

56.—A man, aged 56. Cachectic and sallow, with anchylosis from old disease of left elbow-joint. Firm gray hepatization or granite-like induration of upper lobe of right lung. Universal adhesions of pericardium by cellular tissue, not very firm. Heart thirteen ounces in weight. Valves normal. Left coronary artery very rigid, but not obstructed. Liver presenting an extensive fibrous cicatrix in the left lobe, producing great deformity, and irregular puckering of the surface, and traversed by large vessels and biliary ducts. Kidneys, etc., normal. Intestines not examined. Symptoms of typhoid broncho-pneumonia. Death by asthenia.

57.—A man, aged 28, but apparently older. Emaciated externally. Considerable omental fat. Very chronic tubercle of lungs and intestines. Death by hæmoptysis.

58.—A man, aged 29. Tubercles of lungs and intestines. Miliary granulations of pleuræ. Incipient tubercles of kidneys and spleen. Duration of disease upwards of twelve months. Symptoms of ordinary phthisis.

59.—A woman, aged 20. Disease of mitral valve, with contraction of orifice, and incompetency. Slight granulations on aortic valves. Heart weighing sixteen ounces; right ventricle one-fourth to three-eighths of an inch in thickness; left ventricle normal; left auricle much hypertrophied and dilated, and its endocardium thickened. Fatty degeneration of fibre of heart to a considerable extent. Slight trace of atheroma of aorta. Hydrothorax of right side (one quart). Left pleura universally adherent. Liver pale; the cells slightly fatty. Kidneys very pale, small, rather firm; no appearance of disorganization, but colour unusually opaque. " Renal secreting cells and tubuli were everywhere crowded with very

minutely molecular matter, and small refracting granules." Urine normal, while under observation. Spleen containing a patch of firm yellowish exudation. Lungs œdematous, with hemorrhagic condensation and incipient gangrene of condensed parts.

Description of the Pulmonary Hemorrhage.—"Both lungs crepitated in considerable measure, but were to a marked extent œdematous posteriorly; at many points they showed limited condensation, not marked off by the interlobular spaces; in others less defined condensed portions, not involving more than about one inch diameter in any direction. On section these had in many instances the ordinary characters of pulmonary hemorrhage; but some of them were changed at points to an ash-gray colour; others were soft, friable, slightly fetid, and surrounded by an irregular but strongly marked line of demarcation, of a whitish-gray colour, and fibrous soft texture."

60.—A man, aged 28; anasarcous; lips livid. Universal adhesions of pericardium; rigidity of mitral valve, with granulations on its inner surface, and shortening of tendinous cords. Heart somewhat enlarged in all its cavities; weight, with pericardium and additional length of great vessels, twenty-one ounces. Waxy spleen. Congested kidneys, not otherwise abnormal to the naked eye; but with considerable granular deposit in epithelium. History of case not preserved. Urine was albuminous.

61.—A man, aged 42; pallid, emaciated. Tubercle of lungs with excavations, tubercles of ileum not ulcerated, and tubercular ulcerations of colon nearly healed.

Description of Healing Tubercular Ulcers of Colon.—"In colon several ulcers (seven or eight) of irregular form, not more than half-an-inch diameter; the mucous membrane bevelled flatly towards the centre of the ulcer, and ceasing by imperceptible gradations in the false membrane covering its floor; the latter displaying a number of minute granulations, and the whole showing numerous congested vessels in the neighbourhood of the healing ulcers."

Duration of disease, some years.

62.—A man, aged 33. Purulent infection after lithotomy; multiple abscesses in the lungs; prostatic veins filled with pus; cellular tissue around neck of bladder condensed and infiltrated at many points with pus.

63.—A boy, aged 12; pale, anasarcous, abdomen distended with opalescent fluid, containing numerous fibres of colourless lymph. Omentum condensed and atrophied; intestines matted together by lymph, including opaque masses (tubercles) of atheromatous consistence, and surrounded by a slate coloured pigment. Bright's granulations of kidneys; tubercles of mesenteric, deep cervical, and bronchial glands, in all of these situations mostly obsolete and atheromatous. In apex of left lung a mass of atheromatous tubercle, surrounded by puckering, and extending to the depth of one inch into the lung; elsewhere, in both lungs, only the very slightest traces of miliary granulations. Tubercular ulcerations of intestines—in the small intestine nearly healed. Symptoms mostly those of Bright's disease. Death by asthenia.

64.—A man, aged 33; slightly livid and emaciated, but muscles of good colour and well developed. Tubercle of lungs and bronchial glands (chronic retrograde cavity in right lung, elsewhere rapidly extending excavation). Intestines normal. Hypertrophy of right side of heart—weight, twelve ounces. Symptoms of nine months' duration.—Cough, muco-purulent expectoration, and excessive dyspnœa, with pronounced hectic fever.

64*a*.—A case of typhus abdominalis, with well-marked ulceration of the intestines; hemorrhagic erosion of stomach (examination not performed by the pathologist, the intestinal canal alone described).

65.—A man, aged 40. Fracture of spinal column in dorsal region; compression of cord. Death by asphyxia.

66.—A man, aged 22; pale, somewhat emaciated, slightly anasarcous. Tubercle of lungs and intestines, with the ordinary symptoms, of two years' duration.

67.—A woman, aged 28; pale and emaciated. Tubercle of lungs and intestines; at one point, over a small space, rapid gangrenous excavations, and purulent infiltration of lung. Enlarged waxy liver—weight, six and a quarter lbs.; specific gravity, 1050. "Colour mottled from dingy purple to purplish fawn colour, with ochrey-coloured points very irregularly disposed. Acini very indistinct; cells extremely irregular in form, size, and consistence, some with granular infiltration—the great majority destitute of granules." (Coloured drawings in Dr Gairdner's collection.) Symptoms of phthisis pulmonalis. Duration of disease not stated.

68.—A man, aged apparently about 40; brought to the hospital from the Police-office, labouring under symptoms of alcoholic poisoning. Alcoholic odour throughout the body. Obsolete tubercle of both lungs. No other morbid appearance. Heart contracted, blood loosely coagulated, and of somewhat tarry consistence.

69.—A woman, aged 68—in appearance somewhat younger. Pale, not emaciated; colourless softening of brain, with atheroma of cerebral arteries; rigidity of aortic valves, with slight incompetence. Gray hepatization, and hemorrhagic condensation of lungs; slight atheroma of pulmonary artery. Atrophy and cicatrices of kidneys from obsolete cysts; numerous cysts in both, the largest the size of a wild cherry.

70—A man, aged 20; pale, much emaciated. Tubercle of lungs, with extensive atrophy, and excavation of left lung; right lung containing disseminated tubercles, mostly miliary; some blood in smaller bronchi. Phagedenic ulceration of tip of tongue (without ascertained specific cause). Slight tubercular ulcers of large intestines; anchylosis of elbow-joint. Symptoms of phthisis pulmonalis for two years; repeated hæmoptysis, occasional diarrhœa; urine albuminous for two months before death, but never containing any very marked sediment. No appreciable disease of kidneys, either to the naked eye or the microscope.

71.—A man, aged 57. Rupture of urethra, infiltration of urine, abscesses at neck of bladder and in kidney. Multiple abscesses, and purulent infiltration of lungs.

72.—A woman, aged 35, apparently 10 years older. Not emaciated; contraction of mitral orifice of heart, with incompetency of valve; very slight hypertrophy of right ventricle; laminated coagulum in left auricle, inclosing puriform fluid; pulmonary hemorrhage, old and recent; disorganisation of brain, with both softening and induration; kidneys presenting partial atrophy of cortical substance, with cicatrices. No general disorganisation. Symptoms.—Paralysis of right side one month before death, after an apoplectic seizure. Many years' before death, paralysis of the same arm, which did not last long. For upwards of a year, cough with hæmoptysis when violent exercise was taken. For some time, probably several months, before death, ocular spectra, giddiness, tinnitus aurium, headache. Nineteen days before death another apoplectic seizure, succeeded by increased paralysis of right side. Death apparently by asthenia.

Description of Brain.—"Between the summit of the brain and the centrum ovale, the left hemispheres present considerable disorganisation. In cutting through the disorganised parts, the knife encounters more resistance than ordinary, and the general cerebral substance, as well as its disorganised portion, appears of firm consistence. The disorganised portions extend from surface to centre in irregular patches and lines, involving chiefly the white diverging fibres of the hemispheres, but also at various points the entire thickness of the gray matter of the convolutions. Where the latter is involved, it is of a very light pale straw colour, and the meshes of the pia mater covering it are matted together and highly congested. Where the white substance is involved, it has usually a more pearly aspect than the normal white matter, is to a great extent destitute of vascular points, but has here and there a faint purplish tinge. At several places, the cerebral substance around these portions presents over a limited extent the ordinary appearance of white softening. In the convolutions

most nearly normal, the gray matter presents its concentric laminæ with unusual distinctness, while in the disorganised portions these are altogether lost.

"The ventricles contain not more fluid than usual; the lining membrane of their roof is unusually tough. In the outer part of the left corpus striatum an old cyst, containing clear fluid, the walls quite thin and vascular, without any of the usual pigmentary matter. The diameter of the cyst, which was flattened from above downwards, about three quarters of an inch. Another small cavity, about a quarter of an inch diameter, exists in the posterior lobe, about half an inch from the surface. Around it the cerebral surface is softened for about half an inch. (The thalami optici, crura cerebri, pons varolii, medulla oblongata, corpora quadrigemina, and cerebellum, were examined with the utmost care without finding any other morbid appearance.)

"In all the altered parts of cerebral tissue, microscopic granular matter with granular corpuscles are found. Nerve tubes either much disintegrated or absent. In some parts also, where no distinct lesion existed to the naked eye, traces of granular matter could be seen around the nervous structures and in the ultimate vessels."

Description of Heart and Clot.—"In removing the heart and cutting into the left auricle, a quantity of grumous purplish-yellow fluid, like pus tinged with blood, flowed out on the first incision, and was collected in a tube for microscopic examination. The auricle, which was considerably thickened in its endocardium, presented at its back part a laminated adherent coagulum, which appeared to obstruct to a considerable extent the mouths of the pulmonary veins, and adhere to the endocardium at some points so firmly as not to be entirely removed without scraping the membrane. The coagulum was opaque, granular, and decolourised like that of an aneurismal sac. It appeared to have contained within its layers the puriform matter already alluded to. The endocardium throughout the auricle was thick, tough, deficient in smoothness, and of a whitish opacity. The heart presented no considerable hypertrophy, and its tissue was normal. The right ventricle, however, was unduly firm and slightly thickened; valves of the right side normal. Aortic valves normal; mitral orifice contracted, so as just to admit the little finger. The chordæ tendineæ, averaging half an inch in length, somewhat thickened; the lips of the valve not much thickened, but showing warty vegetations, mostly soft, and moderately firmly attached to the free edge; the longest about half an inch.

"The fluid set aside from the auricle for microscopic examination presented much granular and molecular matter, and corpuscles very granular, but otherwise resembling those of pus or small granular corpuscles of exudation."

73.—A man, aged 35; anasarcous. Very livid, with recent wound of tapping for ascites; chronic disorganization of liver (cirrhosis, peculiar form); enlarged congested kidneys, with granular infiltration of cells, and incipient granulations of Bright; enlarged and softened spleen; weight thirty-four ounces; its capsule thickened and wrinkled. Bronchitis, and purulent infiltration of lung. Duration of disease upwards of five years. Ascites for two years. Intemperate habits. Formerly had remittent fever and dysentery in China. Urine albuminous.

Description of Liver.—"Liver rather large; left lobe dragged out into a thin lamina, projecting about two inches beyond the circumference of the rest of the organ. There are adhesions over the upper and back part of the rest of the organ. Portal veins very much dilated throughout the substance of the liver. Tissue pale, firm, tough, showing granulations of hepatic substance very irregularly disposed, with a great deal of homogeneous, apparently fibrous, substance interposed between the granulations, which are mostly very indistinct, and have not a defined edge. Hepatic cells unusually distinct, not very abnormal, but rather opaque, and darkly shaded. Fibrous tissue presents many clear oval nuclear bodies, about $\frac{1}{200}$th to $\frac{1}{160}$th of a line in diameter."

Description of Kidneys.—"Kidneys very large; together weigh thirty-one ounces; capsules easily removed; surface and section much mottled and con-

gested. Many of the Malpighian corpuscles pale, others congested; no very distinct abnormal appearance in the cortical substance, but traces of granular opacities to naked eye in various parts of the kidney. Under the microscope many cells and tubes much crowded with granular matter; others containing but little abnormal deposit; generally the tubes and cells of large size."

74.—A man, aged 55. Tubercle of lungs and intestines, and of bronchial and mesenteric glands; incipient disease of kidney; partial atrophy of cortical substance; no excess of fatty granules; epithelium somewhat irregular and small; waxy congested liver.

Description of Liver.—(Coloured drawings in Dr Gairdner's collection.) —"Liver weighs five pounds ten ounces, sp. gr. 1060; congested; of firm, waxy consistence; of purplish colour, mottled with yellowish, paler, and more opaque parts; yields to the knife a viscid semi-transparent reddish juice in small quantity, containing blood corpuscles and hepatic cells cohering in clusters, with the form very irregular, and their nuclei mostly small in size, often indistinct, but with very few fatty granules. A few of the cells contain distinct granules of biliary colouring matter, and a good many are faintly tinged with it. On making thin sections of the liver, which is done with greater ease than usual, it appears that the pale and more opaque portions have, generally speaking, more of the tinged cells than the others, but do not appear otherwise to differ from them. All the cells, however, have a more horny appearance than natural, and they appear to be massed together in considerable groups, not very distinct in all cases, but generally about $\frac{1}{20}$th of a line in diameter, (probably corresponding to the areolæ of the portal-hepatic capillary network); among these can be seen, here and there, traces of very small ducts and vessels (but I failed in tracing satisfactorily the relation of the former to the cell masses."—W. T. G.)

Additional Description and Analysis by Mr Drummond.—"The liver not much increased in volume, but much increased in density and firmness. Lobules very indistinct. Had a considerable amount of vascularity, and had a purplish brown appearance, except at one or two points on its surface, where there were indentations caused by pressure of ribs. Here the organ was pale. On section, it presented a smooth, waxy appearance, was of brownish purple colour, mottled with portions presenting various shades of colour, from pale yellow to light orange-tawny. These were irregular in their outline, presenting a branched appearance, resembling somewhat the arrangement of vessels. The branches or processes sometimes were continuous with those from neighbouring portions of same kind, and sometimes disappeared gradually in the surrounding tissue. They presented an opaque appearance, and in several parts surrounded portions of the hepatic tissue, which seemed to correspond to lobules. The tissue of the organ admitted readily of being cut into thin slices. These were quite translucent, except when containing the orange-tawny or yellow portions above mentioned. It yielded on pressure an almost clear, purplish-coloured juice. When a thin section of the organ was examined with a low power, it was found to consist of indistinctly defined masses, the yellow portions occupying the situation between these, and in many cases circumscribing them. On examining a portion of the yellowish matter with a high power, it was seen sometimes to present distinctly the appearance of a vessel or duct, the fibrous tissue composing the walls being distinctly visible. This, as well as the liver-cells near it, were tinged with yellow colouring matter, sometimes occurring in granules, at other times fluid. With respect to the hepatic cells, these were very irregular in their shape, presenting a shrivelled and compressed appearance. They were, in general, smaller than the normal hepatic cells. Their nuclei were small, in some apparently replaced by one or two granules; in others no nucleus was seen. A few of the hepatic cells contained one or two granules of fatty matter. Others, particularly those which were found in the yellowish portions, contained some granules of pigmentary matter of yellow colour.

"On chemical analysis, the hepatic substance yielded—water, 77·81 per cent.; solids, including fat, 22·19; fatty matter removed by ether, 2·57."

75.—A man, aged 22; very pale and emaciated. Tubercle of lungs and intestines; opaque deposits in mesenteric glands and lacteals; calcareous tubercle of bronchial glands; soft lymph in pleuræ.

76.—A woman, aged about 21; slightly anasarcous. Recent rheumatic deposits on aortic valves. Aneurisms of septum ventriculorum, and softening of its tissue. Partial fatty (granular) degeneration of heart. Excess of white corpuscles in blood, in the spleen, and in many of the tissues.

Heart.—"Valves and endocardium normal, except the aortic; these are incompetent, chiefly owing to breaking up of the segment nearest the septum, which is extensively ruptured at its attached margin, and presents a ragged, lacerated edge, thickly coated with soft vegetations of fibrin.

"The free edge of the valve is entire, and its tissue, except at the ruptured portions, is not thickened or otherwise abnormal. The anterior segment is also ruptured at its attachment for one-third of the septal end. The posterior valve is healthy. From the sinus of Valsalva, in connection with the ruptured portions of the valves, the probe can be passed into the softened tissue of the septum ventriculorum. The sinus of Valsalva, at the septal segment, presents three distinct communications with the walls of the heart. The uppermost of these is on a level with the coronary artery, capable of admitting a swan quill, and passes into a sac, about the size of a cherry stone, situated between the sinus of Valsalva, the root of the pulmonary artery, and the septum ventriculorum. The edges of the opening are tolerably smooth and sharp; and a false membrane of considerable smoothness, but thin and delicate, passes over the aneurismal sac.

"The next opening is about a quarter of an inch below the former, about the same size, and passes into an aneurismal sac, formed of a fibro-cartilaginous-looking tissue, about three lines in thickness, and apparently composed of laminæ of fibrin. The sac, which is about the size of a small marble, is wholly imbedded in the septum ventriculorum. Around it the whole tissue of the septum is soft and pulpy for a considerable distance, and this softened, broken down tissue communicates with the sinus of Valsalva very freely by another opening of exceedingly lacerated appearance, and occupying almost the whole breadth of the lower septal segment of the aortic valve. Beneath the ruptured attachment of this segment, the endocardium presents a fringe of soft fibrinous vegetations; much less bulky, however, than those upon the valve itself.

"From the softened substance of the septum, the probe can be passed into the right ventricle, by an opening large enough to admit a goose quill, immediately behind the septal segment of the tricuspid valve. This opening is ragged, with soft edges, coated, as well as the valve near it, with numerous soft fibrinous vegetations. Elsewhere the endocardium is normal.

"The coronary arteries, though passing at no great distance from the softened portion of the septum, are perfectly normal. The tissue of the heart is pale, soft, and friable. The transverse striæ are indistinct in many places; and there are, in some parts, numerous fatty granules. The juice scraped from the surface of the organ contains numerous bodies similar to those contained in the other organs; these are most numerous in the softened parts of the heart, near the diseased valves.

"*Pericardium* contained about one ounce of whey-coloured clear serum.

"*Lungs.*—A few lax adhesions over the upper lobe of right; these adhesions are composed of soft friable lymph. Several firm adhesions over diaphragmatic surface. The left lung had also some soft recent adhesions over the upper lobe; the rest free from adhesions.

"The substance of the lungs crepitant throughout, yielding, on pressure, a considerable quantity of serous fluid mingled with air. When this fluid is examined with the microscope, it is found to contain numerous cell-structures, round in shape, $\frac{1}{2500}$ths of an inch in diameter, and presenting the characters of the white corpuscles of the blood.

"*Liver* soft, and containing, on examination with the microscope, numerous

bodies similar to those in the fluid expressed from the lungs; otherwise the organ is normal.

" *Spleen* large, soft, almost pulpy; Malpighian corpuscles distinct, and filled with opaque milk-like fluid. The pulp of the spleen contains numerous corpuscles similar to those in the liver and lungs.

" *Kidneys* pale; at some parts the cortical substance presents an atrophied appearance, and looks like a lemon-coloured homogeneous deposit. These atrophied portions of the cortical substance vary in size; the ordinary size being about that of a common pea or bean. Towards their margins the Malpighian corpuscles are seen deeply injected, looking like minute specks of blood. These portions of the cortical substance are found, on examination, to contain numerous bodies similar to those occurring in the other organs. These bodies also occur in large numbers in the rest of the cortical substance, but less numerous than in the atrophied portions. In several of the bodies of the kidney, in addition to the ordinary epithelial lining, bodies are also contained similar in their characters to those already mentioned. (In many of the tubes in the atrophied portions numerous compound granular cells are seen, and fatty granules.—*Mr Howden.*)

" *Supra-renal capsules, pancreas, and intestines,* normal.

" *Blood* contains a decided excess of white corpuscles, but these are much less numerous, compared with the number of red blood corpuscles in the blood itself, than they are in the organs."—*Mr Drummond.*

(*To be continued.*)

Part Fourth.

PERISCOPE.

HISTOLOGY.

ON THE MODES OF MEASURING MICROSCOPIC OBJECTS. BY HARTING OF UTRECHT.[1]

The determination of the size of objects seen through the microscope is, on various accounts, important. For when we examine bodies whose nature and distinctive characters are only revealed to us by properties appreciable by the sense of sight, every one of these properties becomes of consequence; and more especially does the determination of the dimensions of such bodies furnish some of their best specific characters,—being among the few which are totally independent of the subjective agency of the observer.

Some have expressed the opinion, that very accurate measurements—at least in the case of objects from the organic kingdom, which vary greatly in size—are not requisite; and that it is sufficient to make an approximation, and express it by a number which, by its simplicity, may assist our conception regarding the size of the objects, without, at the same time, pretending to furnish the precise result of their actual and accurate measurements. This opinion, that micrometry is inapplicable to organic objects, is assuredly quite unfounded. It is true that of a hundred Negro skulls, or of a hundred European skulls, no two might be found of the same exact size; and if both series were compared, skull by skull, it is very likely that some of the former might be discovered larger than some of the

[1] Translated from Het Mikroskoop, vol. ii., p. 287, *et seq.*

latter. But if the mean numbers, obtained from the sum of the dimensions of each series divided by 100, were compared, undoubtedly the *mean* of the first would be found to be smaller than the *mean* of the second series. This, then, would justify the general proposition, that a Negro has a smaller skull than a European.

With the elementary parts, of which the organised tissues are composed, the case is similar. They all vary in size, but within certain limits which can be learnt; for if a sufficient number of measurements of these elementary parts be made, the mean result of each series expressed in numbers will constitute a certain value, which, abstracting the probable amount of error inseparable from such results, may be regarded as a standard, furnishing one of the best specific characters for each object.

In order that the *mean* shall be just, each separate measurement must be taken with exactitude; and this is especially necessary, when it is proposed to use these mean numbers as the foundation for observations on the progressive development of the different tissues at different periods of life.

The best micrometric method is therefore that which gives the most accurate indications. But micrometry, like microscopic vision, has its limits, and the utmost that can be expected of any micrometric method is, that it shall put it in our power to attain results, in *which the probable amount of error is less than the dimensions of the smallest object which can be seen through the microscope.* We shall presently see, that among the micrometric methods some exist in which this extreme limit of accuracy is observed.

It is not enough that a micrometric method should give results of the highest possible degree of *relative* accuracy. These results should be *perfectly* accurate; and, in order to make them so, they should represent fractions of some generally received standard. That no micrometer has been constructed to fulfil this condition, I have satisfied myself by a careful examination[1] of a number of such instruments made by the best artists; and the observed differences in their indications are by no means so small that they may be disregarded without error; for they sometimes amounted to $\frac{1}{20}$th, and in one instance to $\frac{1}{8}$th, of the values of the same quantity on different micrometer scales.

But as the indications of these instruments should be comparable with each other, it is desirable to possess a method, by means of which the absolute dimensions of each micrometer scale may, with sufficient accuracy, be contrasted with those of others. If it be once discovered how much the divisions of a micrometer exceed or fall short of absolute truth, it is not difficult to reduce the results of observation to accuracy.

Mode of Constructing a True Standard.

The method of doing this was, in principle at least, pointed out more than a century ago by Jurin. It consists in winding a thin wire round a thicker metallic rod, and reckoning the number of turns and the length of the whole coil. The latter quantity divided by the former gives as quotient the thickness of the wire.

To construct a true standard by this method, it is, however, necessary to observe certain precautions.

1. The thin wire to be wound round the other must have throughout an equal thickness, and this point must be ascertained by observation. If a copper harpsichord wire be used—and this is very suitable for the purpose, and may be procured from any ironmonger—it must be considered, that the thickness measured on the convex aspect—*i.e.*, the side of the coil next the eye—is always found to be greater than the measurement taken at right angles to this surface. If, then, the

[1] The results of this examination have been published in detail in Recherches Micrométriques sur le Développement des Tissus et des Organes du Corps Humain, précédées d'un examen critique des différentes méthodes micrométriques. Utrecht, 1845.

thickness be determined by counting the turns of the coil, all subsequent measurements must be referred to the dimensions of the same aspect of the wire.

2. In using the copper wire, it is well to twine it round a straight piece of iron wire of considerable thickness—*e. g.*, of 6-8 millimetres (one-fourth to one-third of an inch nearly)—for the contrast in colour renders it easy to ascertain, by means of a lens of sufficient power, or, still better, by means of a compound microscope magnifying forty or fifty diameters, whether the turns of the coil are accurately in contact, on which, of course, the nicety of the resulting measurement in great part depends.

3. The winding is best performed by means of a turning-lathe, more especially as by counting the turnings of the upper wheel the turns of the coil may be best reckoned.

4. Finally, it is self-evident that the length of the whole coil must be measured with the utmost exactitude; for the degree of accuracy finally attainable by all this manipulation bears a direct ratio to the number of turns embraced in this preliminary measurement.

By way of example, I may introduce the description of a determination by myself of the thickness of a copper harpsichord wire. 1048 turns were required to cover a space of 140 millimetres—5·512 inches—which had been first carefully measured[1] and marked off upon the thicker wire. The thickness of the harpsichord wire was consequently $\frac{140}{1048}$ millim. = ·13359 millim. = ·0052595 inches; and as the total turns of the coil were counted with certainty to within one-half of a turn, the greatest possible error could not amount to more than $\frac{1}{2000}$th of the whole length of the coil, nor consequently affect the observed diameter of the wire by more than $\frac{1}{14000}$th of a millim.=about $\frac{1}{350000}$th of an inch. The figure found might hence be regarded as quite correct even in the fourth decimal place. The difference[2] between the diameters of the outer surface of the wire and of the surface at right angles to it, measured successively with a screw-ocular-micrometer, proved to be ·000299 millim. = ·000118 inches.

If, now, the thickness of such a wire be used as a standard, not only can we compare with it the values of the divisions of glass and screw-micrometers, but we may even assume, with much probability, that similar results are true of all micrometers made by the same workman with the same dividing-machine. If, then, those who record their micrometric observations take care to mention the source from which they obtain the instrument employed, or the standard on which their measurements are based, the true measurements may be deduced from their figures by multiplying them by a certain co-efficient, determined by previous examination of a micrometer by the same maker. Thus a careful testing of the following micrometers has taught me that their indications must be corrécted by multiplying by the fraction which follows each, in order to deduce the true value as given by the metallic thread above-mentioned :—

Screw-micrometer, by Schiek,	0·937
Glass-micrometer, by Oberhæuser,	0·959
Screw-micrometer, by Powell,	0·967
Glass-micrometer, by Ch. Chevalier,	0·969
Glass-micrometer, by Dollond,	0·981
Screw-micrometer, by Plöszl,	0·991
Glass-micrometer, by Plöszl,	1·067

—Vol. ii., p. 293.

[1] To measure this I used an iron *metre*, which had been tested by Swinden at Paris, and is now preserved in the museum of objects pertaining to natural philosophy at Utrecht.

[2] This difference of thickness, which occasions a certain degree of flattening of the wire, is here, as in other cases,—for example, the hair of the head,—the cause of the curling (krullen) of such a fibre.

Micrometric Nomenclature.

[In his remarks on this subject, Harting proposes the use of a standard scale in which $\frac{1}{1000}$th of a millimetre, or one *micromillimetre*, is regarded as unity. This method would certainly have the advantage of enabling us to dispense with the zeros prefixed to the significant decimal places in observed measurements, and would give a more distinct relative idea of the size of an object than is attainable by the use of any other nomenclature. But in this country the English inch is usually employed as the standard, and as we write chiefly for the instruction of our English readers, who are not likely to change a system which has been long used among them, for another which, though more convenient, is neither more accurate nor more generally understood, it is unnecessary to reproduce here the arguments by which Harting endeavours to recommend his new method.]—*Trans.*

On the Instruments used in Micrometry.

The number of micrometric methods is considerable; but in the following sections we shall content ourselves with the description of those at present in general use, reserving for the last volume of this work the description of those which have been used by only one, or, at most, by a few observers, and have consequently more of scientific than of practical interest. In the first place, then, we proceed to offer our remarks upon,—

Glass Micrometers.

The art of ruling finely-divided scales on glass with a diamond has been carried very far. Every manufacturer of microscopes supplies his customers with glass plates, divided, according to their wishes, by lines, into hundredths, five hundredths, or even smaller fractions of a millimetre. These glass micrometers differ from each other not only in the degree of minuteness of the divisions, but in the mode in which they are laid down. In some, for instance, the strokes are all of the same length, and differences in the minuteness of the divisions are only indicated by the presence of different groups, in each of which the divisions have a definite value. A better arrangement is that of a common standard measure, in which the coarser divisions are marked out by longer and projecting lines. Finally there are scales divided throughout in one uniform manner, but in which the intersections of two sets of lines, ruled at right angles to each other, form minute squares. Each of the two last constructions has its special advantages; that resembling a common rule being best adapted for simple measurements, while the square micrometer enables us with greater ease to count the number of objects embraced in a certain fraction of the field, and to prepare delineations of objects.

In proving a glass micrometer, three circumstances must be attended to:—

1. The amount of *relative accuracy* of like divisions of the scale. This is in fact the most indispensable requisite in a micrometer, and one which few possess so thoroughly as could be wished. It is not unusual to find, even in micrometers by the best makers, differences between like portions of the same scale amounting to $\frac{1}{25}$th, or even $\frac{1}{7}$th. It is obvious that such differences, however large, cannot, in consequence of the minute division of the scales, be detected by simple inspection. The counting of the divisions embraced by the field, as successive portions of the micrometer are brought into view, can only point out considerable deviations from accuracy; for the extreme margins of the field can but seldom fall accurately upon the lines. To ascertain small differences exactly, the divisions of the micrometer must be each separately measured by one of the most accurate micrometric methods, to be presently explained.

2. A second circumstance to be taken into account is the *absolute length* of the scale laid down on the glass. That the length attributed to it by the manufacturer cannot, without thorough testing, be regarded as correct, we have already

(p. 455) had occasion to remark. If we have procured a metallic wire of known dimensions, by the process above explained, a portion of it may be laid on the micrometer, and it may then be seen how far its breadth corresponds with the intervals between the ruled lines. However, in this case too it will be found that the edges of the wire seldom coincide with the lines denoting certain dimensions; and it is consequently in general better, when we desire to contrast the size of the wire with the divisions of the scale, to make use of comparative results of great accuracy, obtained by different methods.

3. The thickness, too, of the lines ruled on the glass must be taken into account. In a stage micrometer these lines should be as delicate as possible, and should have a smooth, not a splintered, outline. If the micrometer be intended for an eye-piece scale, the lines ought to be, and must be, considerably stronger, so as to make an impression on the eye when viewed through the microscope.

In measuring the intervals, it must be recollected that each extends, not between adjacent margins of two lines, but between their centres, or between their respective right or left margins.

Glass micrometers may be applied to the measurement of objects in various ways. In the first place, the object may be laid on the glass plate, and both may then be brought simultaneously into the field of the microscope. This method is objectionable on several accounts. For, firstly, it can only be accurately applied to dimensions not less than the smallest divisions of the scale; and as from physical causes the divisions cannot be carried beyond a certain degree of minuteness, it is in vain to seek, by this procedure, such delicate measurements as are otherwise attainable. Besides, the results of this method are affected by all the faults in the construction of the micrometer; while, in most instances, and especially when high powers are used, the object and the lines (which never can be in the same precise plane) cannot be both exactly defined at the same time.

The last objection is not applicable to another mode of using the glass micrometer, consisting in adapting to opposite sides of an eye-piece two screws, terminating in fine points, which project into the field of vision, and can be approximated to, or removed from, each other. In measuring an object, the points are screwed apart till the margins of the object correspond with their points; the object is then withdrawn, and a glass stage-micrometer substituted, in order to measure the distance between the points.

This method is somewhat preferable to the former. Not only are the margins of the object, the divisions of the scale, and the screw-points, seen with equal distinctness, but by bringing successive portions of the scale into the field, and taking the mean of the indications observed, the error in the workmanship of the micrometer may be made to vanish. An objection of some consequence, however, is, that time is lost in constantly shifting the object. Besides, the limits of possible accuracy are as speedily reached by this as by the former method. The finest micrometric divisions on glass which the best microscopes yet made can distinguish are those of the ninth group of Nobert's test-plate,[1] in which the intervals between the lines measure $\frac{1}{1520}$ millimetre = ·000026 inches. This, consequently, is the utmost limit of accuracy attainable by the glass micrometer, and it may even be assumed that the diffraction of the extreme rays will prevent this degree of exactitude from being easily reached.

But the glass micrometer may be used in another way, which is in some respects preferable to the methods already described. Instead of being used as a stage-object, it is introduced into the ocular. A Ramsden eye-piece[2] is the

[1] More recent observations with Ross's microscopes have shown, that distances not exceeding $\frac{1}{81600}$th of an inch can be resolved satisfactorily. See Queckett on the Microscope, 2d edition, p. 476.—[*Trans.*]

[2] Two plano-convex lenses, with their plane surfaces turned outwards, and their convex surfaces opposed to each other within the eye-piece tube.—[*Trans.*]

best, for when the micrometer is placed between the lenses of an ordinary Huygenian or negative eye-piece, its image is too much distorted by spherical aberration.

The first advantage of this method is, that in taking measures of the same delicacy by it, one may employ a glass scale more coarsely divided than when a stage micrometer is used. The reason is, that in the former case the divisions of the scale are magnified only by the eye-piece. If this magnifies *ten diameters* and the micrometer is divided into *twentieths of a millimetre*, then each division projected upon a surface at the usual distance of distinct vision (ten inches) will be equal to *half a millimetre*, and if the magnifying power of the whole microscope at the same distance be *five hundred diameters*, then will the value of each division on the field be $\frac{1}{1000}$th of a millimetre. Now, as greater magnifying powers and more finely divided micrometers can be used, it is not difficult to measure in this way, directly and accurately, spaces of $\frac{1}{2000}$th to $\frac{1}{2500}$th of a millimetre = ·00002 to ·000016 inch; and this is greatly facilitated by the more considerable breadth and depth of the lines ruled on the eye-piece micrometer, which may be filled up with black-lead, and thus rendered more distinct.

The chief advantage of the method consists in the fact, that the error in the workmanship of the scale vanishes. Thus, if it has been ascertained that a division is equal to $\frac{1}{1000}$th of a millimetre, then if the relative difference of any two divisions is equal to one-seventh of their diameter (and this is the largest difference which I have ever observed), the results of measurements cannot vary at different parts of the scale by more than $\frac{1}{7000}$th of a millimetre,—a quantity which may be regarded as beyond the power of vision in most cases.

The method has, however, its disadvantages. In the first place it gives no direct measurements, but requires a special calculation of the value of the divisions of the scale for every object-glass which is employed,—for this value is of course diminished constantly as the magnifying power is augmented. For this calculation any object of known diameter may be used—the best is the metallic thread above-mentioned, or a second glass micrometer may be used as an object, care being taken to compare different portions of its scale, and use the *mean* in making the calculation.

A more important objection to the instrument is the difficulty of distinguishing the lines in the eye-piece, when several objects lie mixed together in the field of the microscope. It will serve with great convenience for measuring blood-corpuscles and similar isolated well-marked objects; but to the measurement of ganglion-cells when entangled in their surrounding tissue, of fat cells which are crowded together, etc., it is either with difficulty applicable, or totally inapplicable.

Screw Micrometer.

When a screw is turned upon a piece of metal, we can give it a forward or backward motion, varying in amount according to the number of turns cut upon a given length of the cylinder. If there are five turns in a millimetre, then each revolution of the screw will give a forward or backward movement through one-fifth of a millimetre; if, then, one extremity of the screw be provided with a circular index-plate, divided into one hundred parts, each fraction of a revolution corresponding to such a division will indicate motion through $\frac{1}{500}$th of a millimetre. If, besides, there be applied to the index a *nonius* or vermier, capable of estimating one-tenth of each division, the screw may be made to indicate motion through $\frac{1}{5000}$th of a millimetre.

On this property of the screw depends its application to micrometry. The construction commonly followed is, to make a female screw, and fix it in a position not admitting of change, and within it to place a male screw, to impart a slow motion to the object. The screw micrometers now in use are of two kinds,—the *stage-screw* and *ocular-screw* instruments.

The purpose of the stage-screw is, to impart to a portion of the stage, and consequently to the object, a degree of motion by which the length of the object

can be measured by bringing its extreme margins successively into contact with a thread stretched across the ocular. The length is estimated by the number of turns, or fractions of turns, imparted to the screw.

It has been already (p. 455) remarked, that the accuracy of measurements thus obtained cannot be altogether depended upon, and that one who is acquainted with the mode of cutting these screws, and the sources of error apt to affect their construction, need not be surprised to find variations amounting to $\frac{1}{100}$th or more in their indications. To ascertain the exact value of the scale of a screw micrometer, it is therefore absolutely necessary to test it with a fixed standard, such as the metallic thread already mentioned. The enumeration of the screw turns in a given space, though recommended by many authorities, gives a very uncertain result, in consequence of the shortness of the screw. A glass micrometer can only be used as a standard when the value of its divisions has been previously absolutely ascertained, and the error from inequalities in its divisions made to vanish, by taking the mean of a number of measurements of different portions of its scale.

In examining a screw micrometer, other considerations likewise must be taken into account. In ill-made instruments a certain amount of so-called *dead motion* is observed—*i. e.*, the index-plate may be moved without simultaneous motion being imparted to the object. This error, in course of time, comes to affect the best made screw instruments after frequent use, in consequence of the wearing of screw-thread; hence such instruments should only be used in making measurements, and never for the mere purpose of altering the position of the object in the field. If this fault exists, and the apparatus is otherwise perfect, the results of observation may be correctly obtained by bringing one edge of the image of the object into apparent contact with the thread in the ocular, and then steadily turning the screw forward in the same direction till contact between the thread and opposite margin of the object is obtained; any to-and-fro motion of the object must in this case be avoided.

Inaccuracies in the cutting of different portions of the screw should also be ascertained and kept in view. In instruments by the best makers these are, it is true, but trifling; still, when exactitude is required, they must not be neglected. All different parts of the same screw do not furnish identical measurements, but when the amount of difference is known, the requisite corrections may be applied.

The thread stretched across the ocular is commonly a spider-web thread, although other threads and hairs, and likewise lines ruled on glass with a diamond, are sometimes substituted. It is of little consequence that the thread should be very thin, the great requisite being the accurate definition of the *margin* with which the image of the object is brought into contact. Another error, inseparable from all measurements with the screw micrometer, is the influence of diffraction upon the margins of the object, rendering it difficult to tell exactly when they are in contact with the thread. To remove this source of error, Mohl[1] has advised the substitution of a delicate needle for the thread in the ocular, and the bringing of its fine point into the middle of the field of view. The difficulty is not in this way got rid of, for the diffraction of the rays of light is as considerable between the object and point as between the object and spider hair. The only mode of getting rid of the diffraction is to make the observation by reflected light, and this can of course only be done in the case of certain objects, and under moderate magnifying powers.

To ascertain the amount of accuracy attainable by the use of the screw micrometer, Mohl and I have made some experimental measurements, and calculated the probable error of each separate observation, and of the mean of all. Mohl found in measuring objects of different sizes, with a screw micrometer by Plöszl, that the mean error of ten observations of the same object was $\frac{1}{25000}$th to $\frac{1}{9200}$th of a millimetre,—*i. e.*, about $\frac{1}{13700}$th of a millimetre $=\frac{1}{342000}$th of an

[1] Linnæa, 1842, p. 502.

inch. By measuring a blood-corpuscle with screw micrometers by Plöszl and Powell, I obtained the following results from a like number of observations:—

	Greatest diff. of two measurements.		Probable error of mean.		Probable error of each measure.
Powell, ...	$\frac{1}{492}$ millim.	...	$\frac{1}{9010}$ millim.	...	$\frac{1}{2500}$ millim.
Plöszl, ...	$\frac{1}{760}$ "	...	$\frac{1}{10100}$ "	...	$\frac{1}{3000}$ "

Hence it is obvious, that although the mean probable error of a number of measurements of an object is so minute, that it may in general be neglected; yet a single measurement may, when the object measures less than $\frac{1}{1000}$th of a millimetre, lead to an error of $\frac{1}{4}$th to $\frac{1}{3}$d of the total diameter, which may even exceed this amount, however carefully the manipulation is conducted.

The reason why the best made screw-micrometers of this sort cannot give more accurate results, is chiefly this,—that however steady the whole stage of the microscope is, the pressure of the fingers used in moving the screw causes some alteration in the position of the object, independent of the movement of the screw, so that when the opposite margin sof the image comes into contact with the thread, one is not quite sure that the space which it has traversed is the diameter which it is wished to measure. It should be added, that all sources of error, whether connected with the contact with the thread, or with the workmanship of the screw, are increased in amount with the magnifying power employed.

For these reasons, the stage screw-micrometer must yield in accuracy to the ocular-screw instrument. The most useful variety of the latter is that used in astronomical telescopes; consisting of a Ramsden eye-piece, in the field of which are placed two parallel threads, one of which is fixed, while the other can be moved to and fro by means of a screw. In using the instrument, the margins of the objects are brought within the threads. The value of each turn, and fraction of a turn, indicated by the index of the screw, is ascertained by methods already mentioned, and of course varies with each object-glass employed.

It is plain that, by using the screw in this way as a micrometer, much greater accuracy is secured. An eye-piece screw of five turns in a millimetre, which can only move an object $\frac{1}{5}$th of a millimetre at each turn, will correspond at each revolution, when the object-glass magnifies 100 diameters, to $\frac{1}{500}$th of a millimetre referred to an object on the stage. If the index be divided into 100 parts, each division will measure spaces of $\frac{1}{50,000}$th of a millimetre = about $\frac{1}{1.250,000}$th of an inch. Such delicacy of measurement, which may even be carried further, by means of a *nonius*, is to be regarded as quite superfluous; and hence the ocular screws are commonly made thicker, and with a smaller number of turns in a given space, which enables the workman to finish them with greater accuracy than the more delicate stage-screws.

With an eye-piece screw instrument by Dollond, in which, with a magnifying power of 435, each division of the index corresponded to $\frac{1}{10,630}$th of a millimetre, and with a power of 820, to $\frac{1}{19,600}$th of a millimetre, I have made a series of ten measurements of each of a few objects, with the following results:—

Object.	Power.	Greatest Difference.	Probable Error: Of the Mean.	Probable Error: Of each Measurement.
Blood Corpuscle, ...	435	$\frac{1}{2040}$ millim.	$\frac{1}{31200}$ millim.	$\frac{1}{9940}$ millim.
Glass Micrometer space of ·05 Millimetres, ...	435	$\frac{1}{2040}$ ...	$\frac{1}{30000}$ ...	$\frac{1}{9560}$ ...
Ditto, ·01 Millimetres,...........	850	$\frac{1}{2700}$ ...	$\frac{1}{57000}$ ...	$\frac{1}{18200}$ ...
Intervals between lines on the smallest scales of Lepisma,	850	$\frac{1}{6250}$ ...	$\frac{1}{86000}$ ...	$\frac{1}{27000}$ ...

Hence it appears, that, while the probable error of the mean of each series of observations is far beneath the limit of size at which the eye can distinguish an opaque body through the microscope, the error of individual measurements trenches very closely upon this limit. This is the utmost degree of accuracy attainable by any micrometric method, and in this the ocular-screw instrument surpasses all other contrivances.

The only objection to its general use is its high price; for, to assist the micrometer itself, which of course is a rather expensive article, the stage of the microscope must be fitted with a moveable table, in order to bring the edges of the object into rough adjustment with the spider hairs, which cannot be done with sufficient accuracy by the unassisted hand.

Other Micrometric Methods.

Among the modes of measuring microscopic objects, there are some which have this in common, that they consist in projecting the magnified image upon some surface, where it is measured. The dimension thus obtained being divided by the linear magnifying power, gives as its quotient the diameter of the object.

This procedure is followed in using,—1st, *Various modes of dioptric and catoptric projection;* 2d, *The solar microscope;* and 3d, *The method by double vision* (dubbelzien).

All these methods, therefore, require, in the first instance, an accurate acquaintance with the magnifying power employed. I may add, that in order to calculate the number which should express the magnifying power *for such purposes*, we must not use the ordinary standard distance of distinct vision,[1] but must inquire, what is the amount of magnifying power referred to the fixed distance of the surface on which the image is projected? Of course this problem must be, in the first place, very accurately solved; and in every following observation in which the figures thus obtained are used, care must be taken that the image is projected to exactly the same distance.

Further, one must, when using these methods, remember the influence of the distortion of the image on the apparent magnifying power, and examine the errors from this source at different parts of the field. These may, however, be got rid of by placing a ring in the centre of the ocular, and before every measurement, bringing the object into such a position, that the margins of its image are in contact with the circle.

In the second place, the diameter of the image must be measured with the utmost exactitude,—*i.e.*, at least to tenths of a millimetre.[2]

In making measurements in this way, it is almost indifferent which of the different catoptric or dioptric modes of projection is followed. The different sorts of Camera Lucida and Sömmering's mirror, I have elsewhere described. All, however, require either that the microscope should be directed longitudinally, or that the pencils of light should be made horizontal by transmission through a right-angled glass prism; for images projected on a vertical plane cannot, on account of the unsteadiness of the hand, be readily measured with the requisite nicety. If the image be projected upon a common slate, which is well adapted for the purpose, care must be taken always to use one of the same thickness.

When all necessary precautions are attended to, very exact results may be obtained in this way, as the following account of some experiments with a Sömmering mirror will show :—

[1] This is commonly estimated in this country at ten inches, and in France at 250 millimetres; and linear magnifying power is in general determined by dividing the measured diameter of an object projected on a scale at ten inches from the eye, by its true diameter. Thus if $\frac{1}{100}$th of an inch occupy two inches on the scale, the magnifying power must be 2· divided by ·01 = 200.—[*Trans.*]

[2] Harting has invented a kind of double calipers for this purpose.

Object.	Power.	Extreme Difference.	Probable Error	
			Of Mean of 10.	Of each Measurement.
Blood Corpuscle, ...	740	$\frac{1}{1480}$ millim.	$\frac{1}{24100}$ millim.	$\frac{1}{7630}$ millim.
·05 Millimetre ruled on Glass,	369	$\frac{1}{520}$ ...	$\frac{1}{7812}$ ...	$\frac{1}{2730}$ ...

The probable amount of error is in these two cases rather different, and this is accounted for by two causes. The amount of accuracy increases with the magnifying power. It is true that a power of 740 does not give so sharp a definition as one of 369 diameters; still the amount of error committed in measuring an object under the latter power will be about double of that committed with the assistance of the higher magnifying power. Another explanation of the observed discrepancy, is the different size of the objects subjected to experiment. The size of the blood corpuscle was ·0063 millimetre,—*i.e.*, about one-eighth of that of the micrometer-space afterwards examined; the image in the first case was consequently about four times smaller than in the second. Now the smaller an image is, the more easily can its opposite extremities be at the same time seen by the eye, and the more certain, consequently, is its measure with the compasses; but if an image occupies a large portion of the field, the difficulty of simultaneously seeing both its ends increases with its length, and the chance of error in measurement is thus multiplied. In this point of view, then, these methods are inferior to the use of the screw-micrometer, which measures objects, both great and small, with equal accuracy.

Different kinds of *picture-microscopes*[1] may be used for taking measurements; but as, in their common forms, they require to be employed in a dark room, they are far too inconvenient. The portable solar microscope, especially that which I shall afterwards describe and figure in another part of my work, will be found more serviceable. In it the image is received upon a ground glass plate,[2] and then measured, with the precautions above mentioned.

The following are results of measurements made with this apparatus:—

Object.	Power.	Extreme Difference.	Probable Error	
			Of Mean of 10.	Of each Measurement.
Blood Corpuscle, ...	593	$\frac{1}{1500}$ millim.	$\frac{1}{24400}$ millim.	$\frac{1}{7640}$ millim.
·05 on a Glass Micrometer,...	593	$\frac{1}{840}$ ...	$\frac{1}{13900}$ ...	$\frac{1}{4400}$ ...

It is obvious that in this way too we may measure an object very exactly. The accuracy diminishes with the magnifying power, as in the other methods already described. The diameter of the object also has a certain influence, though less than when Sömmering's mirror is used; but this inaccuracy of measurement with the

[1] Literally *beeldmikroskopen*, including solar microscopes, and all those in which the image is projected on a screen, and viewed by the unassisted eye.

[2] The essential parts of the instrument here alluded to are, an ordinary compound microscope, strongly illuminated by a mirror reflecting the direct solar rays, and a black funnel-shaped tube, the lesser end of which is fixed in the place of the eye-piece, or immediately above it, while its greater and upper end carries the ground glass plate or screen to receive the image. As little external light as possible should be permitted to fall on the upper side of the screen during the observations.

picture-microscope is not, as in the case of the mirror, caused by the size of the object, but is connected with the superior sharpness of the image about the centre of the screen.

Measurement by Double Vision.

The last method to which we need direct attention is that by which an object seen with one eye, is by the help of the other projected and measured upon the stage-plate.[1] The precautions to be attended to in conducting measurements by this method may be here enumerated :—

1st. During the measurement the axis of the eye must undergo no change of direction, and should be kept steadily fixed in one direction.

2d. In order that the extremity of the compasses used for measuring may always be kept at the same distance from the eye, the compound microscope should be provided with a large stage, on which the legs of the compasses[2] may rest. If the stage, as is the case with many microscopes, be too small, it may be widened by attaching to the spring-clips a piece of flattened card-board. In using the simple microscope, or a compound one of small height, the compasses may be made to rest upon the table, or upon the box to which the instrument is screwed.

3d. Upon the surface on which the image is to be projected, a piece of paper should be laid, possessing as nearly as possible the colour of the microscopic field; this will greatly assist the illusion, causing the object and compasses to be both distinctly visible at the same time.

4th. Great care must be taken that the distance between the eye and the plane where the measurement is made shall always remain alike. Hence the slides on which the objects are placed, and the paper itself which we lay on the stage, should always have the same thickness.

Other precautions alluded to in former sections of this article must, of course, be attended to.

[1] The projecting of the images seen by one eye upon a surface seen with the other, is termed *double vision* (dubbelzien). If an opaque body, a finger for example, be held at a certain distance before one eye, so as to hide from it an object a little way off, the other eye will still see the object, and in certain circumstances will, as it were, see it through the finger. This same experiment may, after a little practice, be successfully made with the microscope. If, while one eye distinguishes an image in the microscope, the other be directed to some object held alongside of the instrument—to a pencil, compasses, or the like—both will simultaneously be perceived in the field of vision. If, for instance, we look with the left eye into the tube, while a piece of paper is laid to the right of the instrument, the microscopic field will seem, if both eyes be kept open, to be projected on the paper, and we may even draw on the latter outlines of images present in the former.

The power of double vision must be acquired by practice, but is so easily attained, that I cannot sufficiently recommend it to young observers, not only as the simplest mode of projecting the image, but as the only mode in which it can be done without loss of light. This property is especially valuable, as it affords the only means of perceiving the minuter parts of an object on a projected image. There need be no difficulty in effecting this by *double vision;* and the only precaution to be attended to, in order to make the illusion perfect, is, to give to the surface on which it is desired to project the image a colour nearly corresponding with that of the field of view, and for this purpose papers of different tints may be placed upon the stage.—Vol. i., pp. 259, 260.

[2] A scale for each magnifying power of the microscope is convenient, and may be easily constructed in a few minutes. Let the image of a glass micrometer be projected and drawn upon a piece of paper laid on the stage-plate. To this scale measurements are subsequently referred by embracing the image of the object between the points of a pair of compasses, held at the same distance from the eye; the compasses being then applied to the scale, the included distance is at once read off. The same method is equally applicable to observations with the camera and with the Sömmering mirror.—[*Trans.*]

A series of measurements made in this way gave the following results :—

Objects.	Power.	Extreme Difference.	Probable Error Of Mean of 10.	Probable Error Of each Measurment.
Blood Corpuscle	579	$\frac{1}{1940}$ millim.	$\frac{1}{27000}$ millim.	$\frac{1}{8330}$ millim.
Ditto	332	$\frac{1}{1660}$ ...	$\frac{1}{22100}$ ...	$\frac{1}{7040}$ ...
·05 of Micrometer	579	$\frac{1}{828}$ ...	$\frac{1}{13200}$ ...	$\frac{1}{4000}$ ...
Ditto	332	$\frac{1}{556}$ ...	$\frac{1}{8850}$ ...	$\frac{1}{2800}$ ...
·01 of Micrometer	910	$\frac{1}{2280}$ ...	$\frac{1}{34500}$ ...	$\frac{1}{10700}$ ...
Intervals between lines on smallest scales of Lepisma	910	$\frac{1}{4550}$ ...	$\frac{1}{75800}$ ...	$\frac{1}{24000}$ ...

It is evident from these numbers that here, too, the degree of accuracy increases with the magnifying power and the minuteness of the object. This method, therefore,—the simplest of all micrometric methods and the most generally useful, being alike applicable to the simple and to the compound microscrope,—may be practised with a degree of accuracy surpassing all others, except the measurement with the eye-piece screw micrometer. Of course, this accuracy is only attainable after much practice; yet an observer who has acquired proficiency in the mode of *double-vision* will but seldom be obliged to have recourse to any other means of measuring objects. It is, besides, of consequence to practise this method, as it enables us to make measurements with the greatest rapidity,—a consideration of some importance when a number of observations are to be made and the mean calculated.

In order to make twenty measurements of the same blood-corpuscle by each of four different methods, the following time was required :—

Different screw micrometers, ...	26 to 30 minutes.
Portable solar microscope, ...	18 „
Sömmering mirror, ...	16 „
Double vision, ...	11 „

Choice of a Micrometric Method.

In making choice of a micrometric method, another consideration must have its weight,—viz., the degree of accuracy requisite for the particular species of observation. Of course, when a simple measurement enables us to determine the size of a body with all possible accuracy, this most exact of methods must be preferred. For example, to determine the relative size of an air-bubble, and of the image of an object beneath it, when it is wished to deduce the index of refraction of the fluid surrounding the air-bell, we would prefer the ocular-screw micrometer to all other instruments. But in the case of objects from the organic kingdom, when we have to do with a mean number deduced from a series of observations of different objects, another circumstance suggests itself,—viz., the amount of probable error always connected with this mean, and which in certain cases may even exceed the error probably introduced by the use of a less exact micrometric method. To discover how far this consideration is reasonable, I have made the following measurements with the ocular-screw micrometer, and calculated the probable amount of error in the mean results :—

Objects.	Number of Measurements	Mean Diameter.	Probable Error.
Fibres of areolar tissue	10	$\frac{1}{909}$ millim.	$\frac{1}{17000}$ millim.
Blood corpuscle of a man ...	15	$\frac{1}{130}$ ...	$\frac{1}{6000}$ ...
Primitive fasciculus of mus. gastrocnemius of a child	20	$\frac{1}{173}$ ...	$\frac{1}{4170}$ ...
Primitive fibre from median nerve (man)	15	$\frac{1}{60}$ ..	$\frac{1}{980}$ ...
Primitive fasciculus from psoas of an adult	21	$\frac{1}{19}$ ...	$\frac{1}{500}$ ...

Hence it seems that, in proportion as the diameter of organised elementary parts is large, the probable error is great, and that in the case of objects measuring from $\frac{1}{60}$th to $\frac{1}{20}$th of a millimetre = $\frac{1}{1500}$th to $\frac{1}{500}$th of an inch, it may, even when the mean is deduced from a far larger number of observations, exceed the probable error of manipulation or observation in any of the micrometric methods above described. Consequently, in measuring objects of this sort, it is, in point of accuracy, quite indifferent which of these methods is employed.

But it is otherwise with minuter objects, blood globules, the elements of fibrous tissue, tendon, muscle, etc. Here our choice is more limited, for we should exclude all those methods of which it has been shown that their probable error can have a marked influence on the mean result. This is true, not only of the different species of glass micrometers, but in a less degree of the stage-screw instrument, for their probable error deduced from measurement of one and the same blood-corpuscle amounts to more than double of the mean error deduced from the measurement of several different blood-globules.

When the diameter is yet smaller, we must, for the same reason, betake ourselves to methods of the utmost delicacy,—of these the screw-ocular micrometer is without doubt the most exact. It is, however, nearly equalled in precision by the camera lucida, the Sömmering mirror, and, above all, by the method of *double vision.*

MATERIA MEDICA.

GUARANÁ. COMMUNICATED BY D. RITCHIE, SURGEON, R.N.

A medicinal substance named Guaraná was presented to me about two years ago by a Brazilian. The virtues which he asserted that it possessed induced me to employ it as a remedy in several troublesome and obstinate cases of disease. The consequent benefit was so decided, that I was convinced of the great value it possessed as a remedial agent. This conviction, with the belief that it was still unknown, impelled me to bring the subject under the notice of the *profession* in this country. A short account of it was therefore transmitted to the editor of the "Edinburgh Monthly Medical Journal," who forthwith submitted it to Professor Christison. To the kindness and extensive acquirements of this gentleman I am indebted for the information, that the subject had already engaged the attention of the brothers Martius in Germany, and several French writers. It was a matter of satisfaction to me to find that the opinions I had expressed regarding the great prospective importance of this substance were fully borne out by all those who have diligently examined it.

As a knowledge of the properties and uses of guaraná appears to be still little diffused in this country, I shall consider that I am performing an acceptable service to the medical profession in placing before it an abstract of the more important facts that are known regarding this substance. Public attention was first

directed to it by M. Gassicourt in 1817 (Journal de Pharmac., tom. iii., p. 259); but the merit of discovering the source whence it is derived, and of furnishing a more complete description of it, belongs to Von Martius, in the year 1826 (Reise, vol. ii., p. 1061, *et seq.*)

The term Guaraná is derived from the name of a tribe of Indians, who are dispersed between the rivers Parama and Uruguay, by whom it is very commonly used as a condiment or medicine. It is, however, more extensively prepared for commercial purposes by the Mauhés, an Indian tribe in the province of Para and of Tapajoz, on the banks of the rivers Mauhé, Maragnon, and Tapajoz. It is, according to Martius, prepared from the seeds of the Paullinia sorbilis, a species belonging to the natural family Sapindaceæ. The characters of the species are :— Glabra, caule erecto angulato, foliis pinnatis bijugis, foliolis oblongis, remote sinuato-obtuse-dentatis, lateralibus basi rotundatis, extimo basi cuneato, petiolo nudo angulato, racemis pubescentibus erectis, capsulis pyriformibus apteris rostratis, valvulis intus villosis. The seeds, which ripen in the months of October and November, are collected, taken out of their capsules, and exposed to the sun, so as to dry the arillus in which they are enveloped, that it may be more readily rubbed off by the fingers. They are now thrown upon a stone, or into a stone mortar, and reduced to powder, to which a little water is added, or which is exposed to the night dew, and then formed by kneading into a dough. In this condition it is mixed with a few of the seeds entire or contused, and divided into masses, weighing each about a pound, which are rolled into cylindrical or spherical forms. These are dried by the sun or by the fire, and become so hard as to be broken with difficulty. Their surface is uneven, brown, or sometimes black, from the smoke to which they have been subjected; their fractured surface is conchoidal, unequal, and resinoid; colour reddish-brown, resembling chocolate. This is the guaraná, and in this condition, or reduced to powder, it is kept for use or carried to market. The Museum of the Edinburgh College of Physicians contains a specimen of it in each of these forms. As it is liable to be adulterated with cocoa or mandiocca flour, it is of importance to be aware that the genuine article is distinguished by its greater hardness and density, and in that, when powdered, it does not assume a white colour, but a grayish-red tint.

A chemical analysis of this substance was first made by Theodore Martius in 1826 (Buchner's Repert. de Pharm., xxxi., 1829, p. 370). He found it to consist of a matter (tannin?) which iron precipitated green, resin, a fat green oil, gum, starch, vegetable fibre, and a white bitter crystalline product, to which the efficacy of the medicine was principally owing, and which he named Guaranine. This he believed to be distinct from, but allied to, theine and caffeine, and to possess the following elementary constituents,—C_8, H_{10}, O_2, N_4.

Another very careful analysis of guaraná was made in the year 1840, by MM. Berthemot and Dechastélus (Journal de Pharmacie, tom. xxvi., p. 518, *et seq.*), which varies in some degree from the preceding. They found the matter, which was considered to be resin by Martius, a combination of tannin with guaranine, existing in a form insoluble in water or ether. They also determined the perfect identity of the crystalline matter with caffeine. It is found to exist in a much larger proportion in the fruits of the Paullinia than in any of the plants from which it has hitherto been extracted. Alcohol is the only agent which completely removes it from the guaraná. To this solution the addition of lime or hydrated oxide of lead gives, on the one hand, the insoluble tannates, and on the other, the crystalline matter.

The medicinal virtues of this substance have been attentively examined by Theodore Martius (Op. cit.), and more particularly by Dr Gavrelle (sur une nouvelle substance médicinale, etc.: Paris, 1840), who employed it very often while in Brazil, as physician to Don Pedro, and afterwards in France. By both it is considered a very valuable remedy, and an important addition to the Materia Medica. By the vulgar it is held to be stomachic, antifebrile, and aphrodisiac; is used in dysentery, diarrhœa, retention of urine, and various other affections.

It stimulates, and at the same time soothes, the gastric system of nerves. It reduces the excited sensibility of the cœliac plexus, thereby diminishing febrile action, and strengthening the stomach and intestines, particularly restraining excessive mucous discharges, increasing the action of the heart and arteries, and promoting diaphoresis. It is therefore indicated as a valuable remedy in fevers, or reduced vital power resulting from cold or prolonged wetness, grief, too great muscular exertion, depression of spirits, long watching, and also in colic, flatulence, anorexia, nervous hemicrania, or in a dry condition of the skin. It is contra-indicated in a plethoric or loaded condition of the abdominal viscera, and when there exists determination of blood to the head. It is said to increase the venereal appetite, but to diminish the fecundating power.

In cases where irritation of the urethra or urinary bladder succeed venereal or attend organic disease, it exerts a most salutary effect in soothing the irritability of the mucous membrane, relieving the nervous prostration which accompanies these affections, and exalting vital power. Unlike the disagreeable remedies which are generally, and often without success, employed in these affections, it is taken with pleasure, and with an amount of success which, as far as my experience extends, is universal.

If we examine guaraná according to its chemical characters, it must be regarded as a most valuable substance, from its possessing in so great a proportion that important nitrogenous principle guaranine. This, if not identical with caffeine, is at least analogous to it, and to theine, and theobromine,—all important elements of food and grateful stimulants. From its chemical constitution, then, we may predict with great certainty its physiological action as being powerfully tonic ; but, in the combination in which it is found, experience indicates that it possesses conjoined more valuable properties than belong to the simple tonics. Its power of correcting generally the discharges, and restoring the normal vitality of the mucous membranes, must be viewed as one of these.

Guaraná, in the state of powder, is exhibited in doses of ʒj. three or four times daily, mixed with water and sugar, or with syrup and mucilage, conjoined with an aromatic, as cinnamon, vanilla, or chocolate. A convenient form is that of extract, obtained by treating the guaraná with alcohol, and evaporating to the consistence of pills. This may be exhibited in the form of solution or pills. The Brazilians, however, use the powder with sugar and water alone, and consider this draught grateful and refreshing.

Part Fifth.

MEDICAL NEWS.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.

MEETING V.—*Wednesday*, 3d *March*, 1852.—Dr ALISON in the Chair.

Dr Coldstream exhibited a copy of a "Treatise on Anatomy in the Chinese Language," by Benjamin Hobson, M.B., London, who, having resided in China for thirteen years, has made himself master of the language, and has, with the aid of an educated native, prepared this, the first, work on human anatomy, published in China. It is largely illustrated with lithographs, in which the several parts of the body represented have their names in Chinese attached to them.

TREATMENT OF HEPATIC ABSCESS.

The Secretary read a communication from *Dr Tait*, surgeon, Dunse, "On Hepatic Abscess" (published in "Monthly Journal," for April 1852). The paper was chiefly designed to illustrate the propriety of active treatment in hepatitis, and of opening abscesses of the liver by external incision. The author had seen repeated successful results from this practice.

Dr Alison thought the most original part of Mr Tait's paper consisted of observations tending to show the importance, in some cases, of puncturing earlier than has been the usual practice, when suppuration has been ascertained; but that Mr T. had perhaps not sufficiently adverted to the difficulty resulting from the suppuration, at least in this country, being frequently in the form of numerous small abscesses, not to be benefited by puncture. In some such cases he had observed the febrile symptoms to be more typhoid and less hectic, than when single large abscesses formed.

Dr Alex. Burns had felt anxious to hear the paper read on "The Treatment of Hepatic Abscess," as the disease hepatitis is more fatal to Europeans in India, next to dysentery, than any other; and the connection of these two diseases is remarkable, as well in their intimate relations, as in their great fatality—about 79 per cent. of all Europeans who die in India being carried off by them. This was his experience after twenty years' residence in the Presidency of Bombay. He knew of no treatment for abscess in the liver that offered anything but a bare chance of cure—a vigorous constitution sometimes enabled people to recover, when the functions of the various organs of the body were carefully tended by the physician. He had seen the opening of abscess by the trochar often tried, and in all its stages, but very rarely with success; so very rare were the recoveries, that no faith was to be placed in it. Death followed the operation, sooner or later, by gangrene of the external opening, which no treatment could remedy. Better leave the patient to the chance of the abscess opening of itself into the bowels, or by the lungs, many of such cases being found to recover. Still, as a few cases had recovered, after artificial opening by incision; and still more, when the abscess opened externally itself, there was ground to hope that, by some particular method, the operation might yet be found to be practicable, without the discouraging results that had, so far as he knew as yet, attended the attempts that had been made to discharge the purulent matter. The best treatment of such abscesses was the preventative. In acute hepatitis there was no time to be lost. Syncope by blood-letting at the onset of the disease was essential to its safe treatment; and more than half the cases of hepatic abscess that occurred resulted from the neglect or too timid treatment of this disease. Healthy stations, and wholesome food, with suitable clothing, would do much for the prevention of hepatic disease in India. Further, it was curious to remark the unfrequency of hepatitis in this country; there seemed scarcely such a thing as tropical hepatic disease of the liver in this country; and, again, it was curious to observe the rarity of tubercular disease in India. Amongst the natives there, phthisis pulmonalis was almost as rare as hepatitis in this country,—that is, if they resided in a dry, mild climate; yet they were extremely liable to suffer from tubercular disease of the lungs in moist and cold climates. It was growing a common practice to send from India to Egypt all Europeans who showed symptoms of disease of the lungs, and he believed with very remarkable benefit, except in the worst cases. All this tended to show the necessity of attention, by medical practitioners, to the proper balancing of the functions of the lungs and skin in those of their patients who had hereditary tendency to tubercular disease.

CONNECTION OF ANTERIOR CEREBRAL LOBES WITH THE FUNCTION OF SPEECH.

Dr W. T. Gairdner read a "Notice of *Post-mortem* Examinations in the Royal Infirmary of Edinburgh, November 1851 to January 1852, illustrated by Preparations and Drawings." (The facts of this communication will be published in the present and succeeding Nos. of the "Monthly Journal," see p. 435, *et seq.*)

Dr W. T. Gairdner having stated the particulars of a case of abscess in the anterior cerebral lobes, in connection with apparent injury to the power of articulation, and alluded to the conflicting character of the facts bearing on this subject,

Dr Alison observed that he recollected three fatal cases occurring in the hospital, in which the evidence was as strong as single cases could afford, against the notion of the connection of the power of speech, or rather the recollection of words, with the anterior lobes of the brain. In one an abscess as large as a hen's egg had formed in one anterior lobe of the brain, and the other lobe had been considerably displaced by the enlargement of the diseased one; but this man had showed no loss of recollection of words up to six hours before death, when he became comatose. In the other two cases, there had been almost total loss of the memory of words (along with hemiplegia) for many months before death; and the acts of mind, which seemed nearly natural, had been expressed by signs almost entirely; but in both these the anterior lobes of the brain were found to be sound, and the disease was confined to the outer side of the corpus striatum of the hemisphere opposite to the palsied limbs.

Dr Gairdner (senr.) brought before the Society some particulars of a case, in which he had lately relieved a man from imminent risk of suffocation, by extracting a large portion of beef from the pharynx. The bolus, which was exhibited, weighed an ounce.

REGISTRATION OF DEATHS.

The report of the Committee on Registration of Deaths, laid on the table at last meeting, was again read.

Dr Seller then moved,—" That the Report of the Committee on Registration of Deaths be approved; and that the Committee be requested to act as a permanent Committee of registration; and to appoint registrars to co-operate with them in carrying out the proposed scheme, to defray the preliminary expenses of which the treasurer is instructed to place at the disposal of the Committee the sum of L.20 from the funds of the Society."

The motion was seconded by *Dr Maclagan.*

Dr Alexander Wood objected to the consideration of the motion of Dr Seller, on the ground, that sufficient notice had not been given of the fact, that it involved a money grant. He thought it should have been printed at length in the billets. After some conversation, it was agreed that the motion of Dr Seller should be formally announced, and printed in the billets of next meeting, and that the subject should stand over till that meeting.

Dr Alexander Wood then laid on the table the following amendment, which, being seconded by Dr Halliday Douglas, was ordered to be printed in the billets. Moved as an amendment,—" That it is inexpedient to adopt the suggestions of the Committee at present, and especially to vote a money grant for the purpose; because it is doubtful whether the arrangements proposed can be carried out; and because the sum of L.20, at present proposed to be voted, is only for the preliminary expenses; and the Committee have furnished no data by which the expense of fully working the plan can be calculated."

MEETING VI.—*Wednesday, 7th April* 1852.—Dr BEGBIE, President, in the Chair.

FOREIGN BODY DISCHARGED FROM THE NOSE.

Dr Bennett exhibited a calcareous black substance, about a quarter of an inch broad, an inch long, and 1-35th of an inch thick, curled upon itself, which had been discharged from the nose of a girl, eight years old. For about five years she had been suffering from a swelling and ichorous discharge from the right nostril. The latter symptom had ceased after the substance now before the Society had come away. Dr Littlejohn, of Selkirk, had forwarded it to Dr B., requesting his opinion as to its nature; and on examining a thin section with a

microscope, its appearance was at first very puzzling. No lacunæ or other appearance characteristic of bone could be discovered; but on being treated with dilute nitric acid, it presented the structure of woody fibre, in which the oval discs so common in fir woods were apparent. Dr Bennett therefore informed Dr Littlejohn, that it was very probable a piece of wood shaving had been thrust up the nose, and lodging there, had been the cause of her symptoms. In reply, he was informed that this opinion was almost certainly correct, as five years previously the girl suffered much from worms, and was observed, with other children of the family, frequently to play with shavings, during some alterations which the house was at that time undergoing.

OSTEO-SARCOMA OF FORE-ARM.

Mr Spence exhibited an arm which he had amputated, on account of a large osteo-sarcomatous tumour of the bones of the fore-arm. The patient, a woman, aged 36, had first noticed the growth seven or eight years ago. Four years since she applied to Dr Cruickshank, of North Berwick, who recognised the nature of the case, and recommended amputation, which the patient declined to submit to. The swelling at that time was limited to the lower end of the ulna, and was about the size of a goose egg. The patient afterwards applied to a bone-setter, and tried a variety of applications, until the tumour gradually attained its present enormous size. Some of these applications gave rise to deep ulceration of, and discharge from, the tumour, and the woman became hectic, and at last anxious for its removal, which was accordingly accomplished; and, with the exception of a large abscess over the chest, the case has gone favourably. The tumour weighed eight pounds, and measured fourteen inches in length; greatest circumference, one foot six inches; smallest circumference, one foot. A portion of the tumour examined with the microscope exhibited a number of cells of different forms, all of them containing a number of nuclei entangled in the fibro-stroma of the tumour.

OLD DISLOCATION OF ELBOW.

Mr Spence also showed a dissection of an old unreduced dislocation of the radius backwards at the elbow-joint, exhibiting the changes consequent upon the injury and the altered form of the articular surfaces of the displaced bones, adapting them for some degree of motion.

The following description of the parts has been transmitted by Mr Spence:—

"When the articulation is bent at a right angle, the head of the radius is seen placed below the line of the outer condyle of the humerus, but projecting very considerably outwards and backwards from the condyle. The width of the joint is much increased in the transverse direction, its longest measurement being represented by a line drawn from the inner condyle of humerus obliquely downwards and backwards to the outer margin of the head of the radius. When the elbow-joint is extended as far as possible, and the parts viewed from behind, the deformity is most apparent, the head of the radius then lying upon the posterior surface of the outer condyle. The projection, however, is less than might be expected, owing to the flattening of the anterior aspect of the head of the radius. The relations of the radius and ulna at the wrist are slightly altered, owing to the displacement of the radius upwards, by which the styloid process of the ulna is placed lower down towards the wrist than usual. Near the elbow, owing to displacement of the radius backwards, the interosseous space is very much diminished.

"The head of the radius has undergone great alteration. The anterior part of its circular head, and the corresponding portion of its neck, has become broad and excavated, so as to form a broad shallow cup-like cavity, which receives the external part of the lower end of the humerus. The segment of the circular head of the radius, which projects backwards, has lost all trace of the natural superficial cavity, for articulation with the humerus, and has become rounded and nodulated. The upper part of the ulna is remarkably enlarged and altered in

form, being increased in size transversely, whilst the olecranon process is flattened. The coronoid process is also greatly thickened, irregular on its surface and margins, and nearly double its usual measurement transversely. The greater sigmoid cavity is thus increased in its transverse diameter, and, as it lies on a level with the new articular surface formed on the forepart of the head of the radius, the combination of the two articular surfaces forms a large cavity, serving as a receptacle for the lower articular extremity of the humerus. The lesser sigmoid cavity has become more shallow than natural, and presents two slight osseous projections, marking the attachment of the annular ligament of the radius, the fibres of which ligament have become mixed with the external lateral and anterior common ligament of the elbow-joint. The upper part of the shaft of the radius and its bicipital tubercle are lodged in the remains of the lesser sigmoid cavity.

"The lower articular end of the humerus seems enlarged and more rounded externally than natural; the deep groove which naturally separates its trochlea from the lesser head of the humerus, or outer articular surface, is quite obliterated, so that it presents only one large trochlear surface for articulation with the common articular cavity formed by the great sigmoid cavity of the ulna, and the new concave surface on the radius. Floating loosely in the cavity of the elbow-joint, and attached by a long thin filament to the anterior common ligament, is a portion of semitransparent substance of an osseous hardness.

"Owing to the alteration described, the movements of the joint are much changed. Pronation and supination are very limited; but, from the excavation of the head of radius adapting it for hinge-like movements with the lower end of the humerus, flexion and extension, especially the former, can be performed with comparative freedom."

PULMONARY EMPHYSEMA.

Dr Seller read a paper entitled, "On the Production of Vesicular Emphysema in the Lungs, as Explicable by the Principles of Pneumatics."

The object of this paper was to show that the act of expiration must be essentially the cause of vesicular emphysema, in so far as it is a mechanical effect, in opposition to the view upheld by many recent authorities, under which it is regarded as a result of forcible inspiration.

Founding on the acknowledged belief, that in inspiration the air enters each air-cell on the principle of suction, the author concluded, that the inspired air could only become a cause of unusual distension to any portion of the air-cells, if it were found that the inspiratory muscular forces were capable, under given circumstances, of becoming developed to an extent sufficient to overcome a large proportion of the atmospheric pressure exerted on the outer surface of the walls of the chest—a pressure amounting, on a moderate computation, to 10,000 pounds.

To the view adopted by Dr William T. Gairdner, in his recent papers on "Bronchitis and Bronchial Obstruction," Dr S. devoted a particular consideration. He represented Dr Gairdner's view as an assumption supported only by a limited number of facts, to the effect, that vesicular emphysema never occurs unless the dilatability of the lung, by the collapse of portions of its substance, has become less than the expansibility of the chest under the inspiratory forces. Dr S. described Dr G.'s view as highly ingenious, and much less at variance with the obvious principles of pneumatics than the rest of the views which ascribe vesicular emphysema to inspiration; but he nevertheless regarded it as untenable, for the following reasons:—1. Because there is great reason to doubt if collapse of a portion or portions of the lungs be uniformly a concomitant of vesicular emphysema; 2. Because it is an unsupported assumption that the chest can expand beyond the present limits to which the lungs can dilate, the contrary being plainly the general rule; 3. Because, were vesicular emphysema so produced, there could be no partial form of the disease, but every part of the lung of one side unaffected with collapse would exhibit a similar state of pathological alteration; 4. Because, though no unusual inspiratory force, in the case supposed,

would be requisite to overcome atmospheric pressure on the exterior of the chest, since, could the enlargement occur, it might take place no faster than the air could enter from without; yet an unestimated additional inspiratory force would be necessary to overcome the resistance of the aggregate of the walls of all the still pervious air-cells, in each inspiration by which a distension beyond their greatest natural magnitude was effected—the possibility of the exertion of such a force being an unsupported assumption; 5. Because it is not shown, in the cases of vesicular emphysema founded on by Dr Gairdner, that the aggregate of the distension of the air-cells is in exact correspondence, as to volume, with the aggregate of the decrements which the collapsed portions of the lung have suffered, which should hold, were this view correct.

In support of the view, that expiration is the mechanical cause of vesicular emphysema, Dr S. referred to the forcible compression of the pulmonary air-bag during acts of expiration, great in proportion to the rapidity with which the expiratory forces are exerted, and to the amount of impediment offered at the moment to the free egress of the air by the windpipe; and also to those occasions when, after a very full inspiration, the powerful muscles of expiration violently compress the abdomen and thorax at the same time that the larynx is forcibly closed, so that the air within the lungs is strongly condensed before it is permitted to escape outwards, by the relaxation of the orifice of the larynx. He referred to the frequency of vesicular emphysema in draught-horses, in which it is plainly produced by acts of the latter kind. In proof that pressure of this kind could exercise a distending force on the air-cells when it took place unequally, he referred to the bursting of a bladder by a weight placed upon it, and to the bursting of a paper bag of air when struck at one end. He admitted, however, that the double pressure from without and from within at the same moment, may so far injure the vital texture of the walls of the air-cells, by the compression of the blood-vessels, as to render the distending force more effectual than it otherwise would be.

Dr W. T. Gairdner said, that, notwithstanding the arguments advanced by Dr Seller, he was still of opinion that the inspiration-theory, under the modification which he had advanced in his papers on bronchitis, was the only one which could on mechanical principles account for the production of emphysema. He could not at that meeting enter fully into the discussion of the exceedingly elaborate paper just read, but he would make one or two observations, and endeavour, at the same time, to place his own view in a simple and clear form before the members. But first, as to the expiration-theories of emphysema in general, he was still at a loss to understand how the force of expiration could ever become a cause of dilatation, either of the whole pulmonary sac, or of a portion of its vesicles. Expiration was essentially a *compressing* force, acting from without, and tending to *contraction* of the air-vesicles; and although the effect of this force might to a certain extent be counteracted or neutralised, when the glottis was closed, by counter-pressure from within, the amount of this internal pressure was always exactly proportionate to the external, and could, therefore, never act so as to produce distension. The case of the air-filled bladder burst by external pressure, did not, in Dr G.'s opinion, at all bear upon the question; for, in the first place, the bladder in such circumstances bursts because it is compressed in only one direction, and allowed to expand indefinitely in others, whereas the lung is guarded on all sides by the thoracic parietes, which, in the physiological act of coughing, or other impulsive expiratory acts, prevent its air-cells from being subjected to any kind of distortion of form, such as occurs under the one-sided pressure which produces bursting of the bladder. But, further, the blown bladder, although burst by external pressure, is really never distended, but on the contrary diminished in volume; whereas no one can doubt that in emphysema the air-cells are not so much altered in form as subjected to inordinate distension. The blown bladder is flattened by the force which bursts it; the emphysematous air-cells are permanently expanded, and retain the rounded appearance, even when many of them have been fused into one large

bulla by partial destruction of their walls. But, supposing it granted that the expiratory forces might, under peculiar circumstances, act so as to produce partial compression and disorganisation of individual air-cells, this would not account for the cases where inordinate distension of the air-cells was observed over a large extent of the lung; still less for the alleged cases of universal emphysema, which had been advanced in opposition to his (Dr G.'s) theory. The view he (Dr G.) took of the production of emphysema was this:—Two complex forces acted mechanically on the lung in respiration; the one, that of expiration, a compressing and contracting force as regards the pulmonary air-cells; the other, inspiration, an expanding and dilating force. Independently of the arguments already used, he thought it natural to ascribe emphysema, in so far as this was a mechanical lesion, to the action of the latter or dilating force, in preference to the former. It was not difficult to conceive that, as the forces of inspiration have the power, physiologically, to distend the air-cells *up to* their normal maximum, so they might, under certain pathological circumstances, have the power of distending certain air-cells *beyond* their normal maximum. This was what had been assumed to take place by all the advocates of the inspiration-theory of emphysema; none of whom, however, had, in Dr G.'s opinion, correctly generalised the conditions of emphysema, or stated the law of its production. In fact, the lung was accurately adapted by nature, in size and form, to the case in which it was enclosed, and the alternate expansion and contraction of which it followed, in consequence of mechanical laws which were understood by every one. No amount of inspiratory power could, in the physiological state, dilate any portion of the lung inordinately, because the thoracic case in which the lung was enclosed was not dilatable beyond a certain amount, and the lung was adapted by nature to bear dilatation to that amount without injury. But let any portion of the lung be rendered undilatable by disease, *being at the same time diminished in volume*, and it then became possible for the chest to expand so as inordinately to dilate the remaining pervious air-cells, which would tend to occupy the space forfeited by those which were diminished in bulk. Contraction, collapse, or atrophy, therefore, of some portions of the lung, from disease, with inordinate expansion of the sounder portions under violent acts of inspiration, were the conditions under which emphysema was produced. In writing at large on the subject of bronchitis and its consequences, Dr G. said, he had been at some pains to describe the varieties of these lesions observed in the dead body, and to demonstrate by an analysis of cases of emphysema, the coincidence of that affection with the states of the lung leading to partially diminished volume. He had also fully explained the sources of collapse and atrophy of the lung, and directed attention to the great frequency of these affections, and to their connection with, and dependence upon, obstruction of the bronchi in bronchitis and other diseased states. He was, therefore, prepared to state, that his theory of emphysema was the fruit of an extensive observation of facts, and he believed it would be found universally applicable, to the exclusion of the expiration-theories, and all the inspiration-theories not founded on the idea of partially diminished bulk in the lung, as the essential cause of emphysema. Other circumstances in the natural history of emphysema were perfectly explained by this theory; as, for instance, its ordinary seat in the anterior edges, the parts least subject to other diseased conditions; its frequency in connection with retrograde or cicatrising tubercle, and its comparative rarity in connection with advancing tubercular disease, and generally with all states of the lung in which large excavations, with flaccid dilatable walls, took the place of the pulmonary air-cells in maintaining the full volume of the lung in the act of inspiration. For the fuller development of his views, Dr Gairdner referred to his memoir on bronchitis, and expressed himself much gratified with the intelligent and careful consideration which Dr Seller had thought it worth while to bestow on his (Dr G.'s) labours.

Dr Alison remarked that he was disposed to agree generally with Dr Seller in believing emphysema to be produced in expiration. He had never been able to

understand what force, adequate to the rupture of the walls of the cells, could be supposed to be called into play by any effort of *inspiration*. He did not think that emphysema of the lung was *always* determined by other lesions, as said by Dr Gairdner; and thought he had seen cases of emphysema affecting the whole lung, at least unattended by such condensation of any part of the lung, as to render it impervious to air.

Mr G. Glover commenced by remarking, that, in the present transition state of medical science, he was glad to find the author of the paper appealing to acknowledged principles in physics. It was dangerous to proceed practically upon an imperfect knowledge of a few first principles in science; and when applying the principles of pneumatics as "explicable of vesicular emphysema," our ideas must be clear and precise, and the application correct;—not attributing to causes effects for which they are quite inadequate. The unscientific term "suction," used in the paper, was vague, and often meant nothing, at least nothing upon which correct reasoning could be founded. The enormous pressure attributed to the tendency to a vacuum ("suction") in the chest during tranquil breathing, was greatly overrated. And to show the small amount of the force, he suggested to Dr Seller the simple experiment of putting one end of a glass tube in water, and the other end in his mouth, during ordinary breathing, when he would observe the water scarcely rising *one inch* in the tube during each inspiration, instead of thirty-three feet, which would be required to represent about fifteen pounds of pressure on every square inch of surface. With regard to Dr Seller's observations on the bursting of a bladder and a child's paper bag, he stated, that, while the paper bag would be easily burst by a sudden percussion, the bladder containing air would sustain hundreds of pounds of pressure before bursting. It is a fundamental principle in pneumatics, that pressure exerted on a fluid must be equal, and in all directions; so that no part of a bladder containing air, and subjected to pressure, could be unequally pressed upon. The bursting pressure would be equally diffused over every part of the surface of the baldder. As an illustration of the principle of equal pressure in fluids, he gave the instance of the early development of the embryo in the uterus, where the most delicate structure floating in a fluid is not ruptured by the violent motions of the mother, or by external violence. He had listened attentively to the paper, but was not prepared to support either theory, regarding the production of vesicular emphysema by inspiration or expiration. If produced by inspiration or expiration, it would be of more frequent occurrence. At the same time, in cases of asthma, he would feel more inclined to attribute the production or increase of emphysema to the long and laborious efforts of expiration than the short and easy inspirations. He mentioned that, some days before, he had opened the body of an asthmatic female, where the whole lungs appeared to be emphysematous; and when placed in water they floated very lightly on the surface. Drs Keiller and Menzies were present at the dissection.

Dr Alexander Wood was of opinion, that in the discussion, in the anxiety to attend to physical laws, vital laws had been too much overlooked. The natural tendency of every yielding tube was to become stretched when pressed by air on its internal surface. In health the air-cells of the lungs resisted this by their vital elasticity. The tendency of all the diseases with which emphysema was associated was to destroy this elasticity. He doubted the alleged fact on which the new theory was founded—that some diminution in the size of the lungs was found in every case of emphysema. He believed that the forcible entrance of air into the lungs could produce emphysema, as was witnessed as the sequel of too zealous efforts to resuscitate still-born children. He believed that impediments to the exit of free air did the same, or else how was emphysema produced in hooping-cough? Not surely by the impeded inspiration, but by the impossibility of the air-cells getting rid of their contents; while, at the same time, the collapsing lung and falling down parietes forcibly compressed it.

Dr Strachan, of Dollar, in illustration of the applicability of the inspiration-theories to the production of emphysema, referred to the expansion and bursting

of a partially air-filled bladder under the receiver of an air-pump, the exhaustion of the receiver producing on the walls of the bladder a similar effect to that exerted by the expansion of the thoracic parietes on the lung.

Dr Bennett observed that, with respect to vital and physical properties, he considered that the former were so called simply because they could not, in the present state of science, be explained by physical laws, and were peculiar to living beings. The present tendency of physiology was to cultivate physics and chemistry; and in proportion as these explained what was formerly unknown, the so-called vital phenomena diminished in number. No doubt some of these latter, such as contractility in muscle, sensibility in nerve, reproduction, and so on, had not yet been brought into the domain of physics, and hence why these must still be considered as purely vital phenomena. With regard to emphysema, however, the case was different; and it appeared to him that its production, like the phenomena of respiration, was, to a certain extent, explicable by physical laws. In such a case he was unable to understand what Dr Wood meant by vital, as distinguished from physical resistance of the lung. It appeared to him clear, that if, in the healthy condition, the lungs completely filled the thoracic cavity, and that if, when diseased, a portion of their structure was collapsed, that the sound parts would be expanded by the pressure of the atmosphere, and fill up the vacant space. This was Dr Gairdner's theory. It had indeed been urged, that the over-distended, or emphysematous pulmonary tissue, occurred without such collapse having been seen. But he considered this to be an example of what frequently occurred in pathological investigation, namely, that such partial collapse of a lung might not be seen, because not looked for. Let a lesion be once carefully described, and the attention of observers directed to it, and a morbid appearance formerly unknown subsequently became very common. This he believed to be the case with partial collapse and condensations of the lung as a cause of emphysema. He had himself remarked the frequency of emphysema in conjunction with certain diseases producing partial contraction and condensation of the lung, as in chronic phthisis. The same fact had been observed by Dr Ramage, who, in consequence, had erroneously considered that the production of emphysema was the natural cure of tubercular caverns. He also agreed with Dr Gairdner, as to inspiration being the act of real difficulty in cases of emphysema. The prolonged expiration was principally owing to the impaired elasticity of the pulmonary tissue itself, whereby the air-vesicles were not compressed, and the chief mechanical force during the expiratory act more or less impeded.

Dr W. T. Gairdner observed, that he scarcely required to add one word in explanation to what had fallen from Dr Bennett, with which he entirely agreed so far as the subject of emphysema was concerned. He would, however, remark, that there were three different forms of atrophic lesion, which might give rise to emphysema: the simple mechanical collapse of the lung; the simple chronic atrophy, resulting from that collapse; and the various kinds of atrophy with induration, resulting from pneumonia, tubercle, etc. The last could not be overlooked with moderate attention; but the first might easily be neglected by a superficial observer; and the second, having mostly negative characters, was almost sure to be overlooked by any one, however careful, who came unprepared to the investigation. Since he had given particular attention to the development of emphysema, however, Dr G. had not found a single instance of that lesion in which he had not been able to demonstrate its connection with one or other form of atrophic disease.

The Secretary intimated that he had received a communication from *Dr Martin Barry*, "On a New Process of Baron Liebig, for Determining the Quantity of Urea and Common Salt in Urine." As it appeared that the paper was merely an announcement of a detailed one by Liebig (to be published in May), and as it contained nothing but what was already published in various journals, it was agreed that the paper of Dr Barry should lie on the table.

REGISTRATION OF DEATHS.

The report of the Committee on Registration was again brought under consideration, in accordance with the resolution of last meeting of the Society. The motion by Drs Seller and Maclagan, and the amendment of Drs Wood and Halliday Douglas, as inscribed in the minute of last meeting, were brought before the Society, and a debate followed, in which Drs Seller, Wood, Bennett, Glover, Christison, Alison, Andrew, W. T. Gairdner, and H. Douglas took part. The Society then divided on the amendment and on the original motion, when there appeared

For the amendment, ... 15
For the motion, ... 21

Dr Seller's motion was therefore declared carried.

Dr Christison then moved—"That the subject be remitted to the former Committee, with power to prepare and deliver a second report." Seconded by Dr Bennett, and carried unanimously.

EDINBURGH PHYSIOLOGICAL SOCIETY.

MEETING VI.—*January* 31, 1852.—Professor BENNETT, P., in the Chair.

(*Continued from March No. of Journal.*)

ON THE MOLECULAR ORIGIN OF THE TISSUES. BY DR BENNETT.

The great generalisation of Schwann was that all tissues are derived from cells. Subsequently, it was ascertained that the nucleus, or cell-germ, exercised an influence on the tissues, independent of its cell wall; and it was endeavoured to be shown, that some tissues might be derived directly from nuclei. The object of this communication was to point out that the nuclei themselves originated from smaller bodies,—viz., molecules; that these were the origin of every texture, and to indicate some of the laws which governed their formation, arrangement, and subsequent development. From a review of the observations of Schleiden, Schwann, and Martin Barry, the author pointed out how the first appearance, observable in all developing organisms, was a mass of molecules and granules, which, by aggregating or melting together, constituted the cell-germ. Around the cell-germ other molecules were formed, which again, by melting together, constituted the cell wall. Further development, in like manner, proceeded by the apposition of molecules. At any period in the process of evolution, the onward progress might be checked when the structure became disintegrated in the inverse manner to its formation: First, the cell wall became dissolved, then the nucleus, both of which were reduced, first to molecules then to a fluid. Hence there were molecules of evolution and molecules of disintegration. Occasionally, between the cell wall and nucleus, secondary molecules were formed, which constituted peculiar secretions, as they have been termed. These might be called molecules of transformation.

The author described the origin and mode of formation of these three kinds of molecules, their physiological and pathological importance, and pointed out the advance which had been made in our knowledge of molecular formation by the observations of Ascherson, Harting, and Melsen.

In complex organisms, the higher tissues were formed by an elaboration of blastema, mainly due to the successive evolution, transformation, and disintegration of matter, by means of the three different kinds of molecules, of which the author gave numerous examples, derived from the elaboration of the ovum, of the blood, the transformation of insects, the process of fissiparous division in the lower animal forms, etc. He pointed out that molecules had independent movements, sometimes physical, as in the case of Brown's molecular movements, at other times vital, as seen in many organisms. That occasionally we had molecular

fibres, from the aggregation end to end of molecules, in the same way as we have nuclear cell fibres. Moreover, each kind of fibre could assume inherent contractility, as in the case of vibriones, which might be called contractile molecular fibres, as spermatozoa might be denominated contractile nuclear, and cilia contractile cell fibres.

The author concluded a lengthy communication by remarking, that not only did a study of the molecular element indicate the origin and development of healthy and morbid product, but it pointed out the basis on which a rational treatment was to be founded, as far as diseases of nutrition were concerned. Thus in tubercular diseases, where molecules of evolution were deficient from absence of the fatty element in the chyle, animal oils were indicated to favour the production of such molecules. When the blood was diseased, in cases of gout, rheumatism, rachitis, scurvy, etc., such morbid conditions could only be removed by the introduction of substances which either directly or indirectly, physically or chemically, favoured the production of certain molecules of transformation, as those in the blood. And when any of the tissues seem redundant and hypertrophied, tumours constituted the morbid condition; thus the cure would depend on the discovery of those means, whereby granules of disintegration might be induced and subsequently eliminated.

MEETING VII.—*February* 14, 1852.—Professor BENNETT, P., in the Chair.

ON PATHOLOGICAL CELL-DEVELOPMENT.

1. *Dr W. T. Gairdner* made a verbal communication of considerable length, on certain peculiarities of pathological and other structures, as bearing on the different theories of cell-development. He considered the cell-theory of Schleiden and Schwann, although it led to the discovery of many interesting facts, and really important morphological generalisations, to have been utterly overthrown, as a general theory of development, by the progress of scientific inquiry. The "cell" of these physiologists, so far from having the fixed and uniform character of a basic type of form, was the most fluctuating and uncertain of all morphological creations. Its form, size, law of development, were either confessedly uncertain, or had to be stated in terms so vague as to lead to the conclusion that form and substance, and perhaps microscopic size, were the only attributes essential to the idea of a cell. No one could tell, in practice, what was a cell-wall and what was a nucleus, and no one could give a satisfactory theoretical definition of either, or resolve, for all cases, which of the two preceded the other in the course of development. The theory of "germinal centres," held by Mr Goodsir, in so far as it ascribed to certain "nucleated particles" the function of the cell, was, in Dr Gairdner's opinion, subject, in like manner, to the imputation either of vagueness or of want of comprehensiveness. If these nucleated particles came under any more precise definition than was applicable to every kind of organic or inorganic structural atom, it would be very difficult to show that they monopolised and centralised the whole functional activity of the organism, or were more necessary than other parts to its growth and preservation. He (Dr Gairdner) believed that there was no distinction in the organism of passive and active atoms, and considered every point and every molecule as endowed with its own life, and placed, in its own peculiar sphere of activity, in harmony with the rest. He agreed with Dr Bennett in thinking, that many tissues arose from elements far more minute that any to which the term cell or nucleus had been applied; indeed, he was far from thinking that our microscopes had conducted us back to the real germs of the tissues, and considered that the structural, like the chemical atom, still lay in the remote region of hypothesis. He firmly believed, however, in these hypothetical germs, and could not conceive of the tissues being formed by anything like what the Epicureans would have called a concourse of atoms, according to their physical and chemical properties. Hence he did not think, that by the mere introduction of peculiar molecular elements into the food, we

could either create new tissues or destroy old ones, so directly and simply as had been hinted by Dr Bennett.

The positive part of Dr Gairdner's communication consisted in the detail of observations on the structure and development of the pus-corpuscle and other pathological structures, intended to show that the so-called cell-walls were often generated in great numbers without nuclei; and that the whole of the facts of cell-development contradicted the idea of any part of a cell being, more than another, the source of its functional activity and development. In regard to the development of fibres, Dr Gairdner thought there was no evidence that these were ever produced from cells, under any circumstances; and he had long been in the habit of regarding the so-called fibre-cells as merely transition-types in morphology, and not parts of a physiological succession of stages of development. It was difficult to prove this view any more than its opposite, but he thought any one who would give it consideration in original observations, would find it in harmony with all the known facts, both physiological and pathological.

Dr Sanders remarked, that Kölliker had demonstrated unstriped muscular texture to be composed of permanent fibre-cells, whose development by elongation of spherical nucleated cellules he had traced in the pregnant uterus. This texture, therefore, had been lately found a corroboration of Schwann's views, which it was previously thought to contradict. Doubtless some textures were formed without passing through the form of cells: thus, particularly, fibrous tissue, as observed in cartilage by Redfern and Donders: yet the constant presence of nuclei and cellules in skin, mucous membranes, glands, and bone; their transition forms; their extensive development in the fœtus; their occurrence in newly forming textures in all organised beings, animal and vegetable, gave immense weight to Schleiden and Schwann's views, and justified our adherence to them in physiological anatomy. In pathology, their application appeared more limited, and less satisfactory. Dr Gairdner's statements, and a gaining distrust among observers at home and abroad, proved the necessity of submitting the "cell theory" to the criticism of new and extended observations; it ought not, however, to be rejected, but only thoroughly re-investigated.

STRUCTURE OF ARTERIES.

2. *Mr Drummond* exhibited several preparations of the middle coat of the aorta in the ox, for the purpose of showing,—1st, That many of the fibres present a distinctly transverse striated appearance. They are branched generally, and anastomose with neighbouring fibres, presenting an appearance very similar to the branching striated muscular fibre, seen in some of the Insecta. From muscular fibre, however, they differ in their chemical constitution, agreeing in this respect with yellow elastic tissue. They are in all probability analogous to the striated fibres occurring in the ligamentum nuchæ of some animals. When viewed with a high power, many of them seem to present a series of cup-shaped depressions, arranged in linear series in the longitudinal axis of the fibre, with intervening ridges or partitions, to which the striated appearance is owing. 2d, That the structure described under the name of the fenestrated coat of Henle, as it occurs in the middle coat of the aorta in the ox, is formed by the amalgamation of the network of the yellow elastic fibres, the fenestræ or perforations being merely the remains of the areolæ between the fibres. The fibres which go to the formation of this coat often present traces of the transverse striated appearance above described. Preparations were also shown illustrating the development of the yellow elastic tissue as it takes place in the ligamentum nuchæ of the calf. A description of the development of this tissue will be given in a future report.

MEETING VIII.—*February* 28, 1852.—Professor BENNETT, P., in the Chair.

1. *Dr Bennett* showed, under the microscope, demonstrations of the blood in a case of leucocythemia, in the practice of Dr Monro of Dundee.

2. *Dr Gairdner* exhibited various organs, as well as the clot of the blood, and a slightly enlarged and softened spleen, in what he considered as an incipient case of leucocythemia, probably the earliest stage of the affection yet observed. The patient died of acute rheumatic endocarditis, with disorganisation of the aortic valves, and septum ventriculorum. The tissues, the blood, and the spleen, contained an excess of white corpuscles.

Dr Sanders was requested to investigate the spleen in this case.

DEVELOPMENT OF PUS-CORPUSCLES.

3. *Dr Sanders* reported some observations on the corpuscular contents of the vesicles of small-pox. On the 4th day of the eruption, the fluid of the vesicle presented some clear, gray nuclei, about the size of blood-corpuscles, and showing only one or two granules in their interior when acted on by acetic acid. On the 5th and 6th days these corpuscles had increased in size and numbers, and become more granular; the amount of free molecules and granules, at first very scanty, was now greater. On the 6th and 7th days, nucleated cells, spherical, and more or less granular, occurred along with the corpuscles before described; and a few large cells, of the diameter of four to five blood-discs, and containing several nuclei imbedded in granular matter, were also observed. The corpuscles, however, were the chief elements; they were granular, like the usual pus-corpuscles, and presented under the action of acetic acid, some a triple nucleus, others several granules. From this stage, when the fluid was distinctly purulent in its characters even to the naked eye, up to the time of scabbing, or 12th day of the eruption, the changes were a gradual increase in the free granular matter, and a diminution in the amount of corpuscles, which at last gave place to the granular matter; which last, along with epithelium cells, dried up to form the scab. The fluid of the vesicles therefore exhibits a process of cell growth from nuclei to pus-corpuscles, and nucleated cells, which become more and more granular, and break up at last into free granular matter. The so-called pus-corpuscles are a stage in cell formation. Considering the small amount of granular matter, both free and within the corpuscles at the beginning, and its great abundance subsequently, the author was disposed to doubt the formation of these corpuscles and cells by the aggregation of granules subsequently surrounded by a cell-wall, but regarded the granular matter rather as a production of cell growth.

4. *Dr Sanders* also communicated the following observations

ON THE CONTENTS OF THE CYST IN A CASE OF RANULA.

In the fluid contents of a ranula existing on the left side of the tongue, and evacuated by incision, the liquid was transparent or slightly opalescent, viscid, and tenacious, and forming a thick, curdy precipitation on the addition of nitric acid. Under the microscope (250 diam.), a large number of cells were seen in different stages of growth: the most numerous about 2·3 centimillimetres diam., granular, generally with one, sometimes two, nuclei. Some larger cells, of 4·5 centimillimetres, coutained several, sometimes four or five, clear, shining nuclei, imbedded in granular matter in their interior. On dilute acetic acid being added, the nuclei became more distinct; and in the larger cells, the granular matter, with its imbedded nuclei, contracted into a mass, and separated from the cell-wall, leaving it clear and projecting, like a watch-glass, at part of its circumference. A curious phenomenon was also noticed: several clear, spherical, celloid processes were developed at the circumference of many of the cells from which they appeared to proceed.

5. *Mr Drummond* mentioned, in opposition to the assertion of Zimmerman, that the blood of the fœtus contained no fibrine, that he had recently found it to contain a considerable quantity of that substance.

OBITUARY.

DEATH OF DR SPITTAL.

It is our melancholy duty to announce the death of this well-known and amiable physician, which took place at his house in London Street, Edinburgh, on the 7th of April, in the forty-eighth year of his age.

Dr Spittal, while yet a student, and while filling the office of Physicians' Clerk in the Royal Infirmary, occupied himself both zealously and successfully in the practice of auscultation. In 1830, he published a highly original work upon this branch of physical diagnosis; and throughout his whole career was distinguished for the enthusiasm with which he laboured to perfect the means of exploration in diseases of the chest and abdomen. He was a Fellow and Councillor of the Edinburgh Royal College of Physicians; was long attached as Physician to the Royal Dispensary, and for several years to the Royal Infirmary. Some years ago he delivered courses of instruction in physical diagnosis, and in practice of medicine.

For several months before his death Dr Spittal had been in a delicate state of health, and it was but too apparent to his friends that he was labouring under a complication of diseases—of the aorta and kidney—which rendered the prospect of recovery all but hopeless.

His death is much regretted by his medical brethren, who entertained for him sincere esteem and respect, well merited by the many good qualities which were conspicuous in his professional and social life.

THE LATE STAFF ASSISTANT-SURGEON ROBERTSON.

Among the sufferers in the wreck of H. M. steamship Birkenhead, off the Cape of Good Hope, we grieve to record the loss of Dr John Robertson. The deceased officer was a native of Elgin, being one of two surviving sons of the late Mr Robertson, banker in that town. As a student of medicine in this University, Dr Robertson was not less the object of his teachers' esteem than of his fellow-students' admiration and respect. He won many prizes; finishing his career as a student by a distinguished graduation in 1847, and by obtaining from the Royal College of Surgeons a presentation to the medical service of his country, placed at the disposal of the College by Sir James M'Grigor. During his whole service in the army, Dr Robertson remained attached to the staff, doing duty successively at Chatham and Dublin, and at Chatham again. At the latter station, he was principally engaged in the study of pathological anatomy, in performing the post-mortem examinations, and in the superintendence of the museum connected with the hospital. From these duties he was removed on the appearance of cholera in the Ionian Islands in 1850, being selected to proceed to Cephalonia, in order to render additional medical assistance, then much required. In Ithaca and Cephalonia he remained some months, returning thereafter to England, and to the discharge of the same duties at Chatham from which his absence abroad had temporarily removed him. There he remained, with the exception of a short visit to Edinburgh in last October (when we were so fortunate as to see him, and when he took his last farewell of an affectionate mother and an attached brother); and there, had it not been for the disastrous war in Southern Africa, and for the necessity existing for the dispatch of sufficient medical assistance, he would in all probability have been now; but, alas! it was otherwise ordained. The sequel of his too short life is already told. He sailed in the Birkenhead on the 2d of January, and on the 26th of February, off Algoa Bay, he met his death.

Dr Robertson has been cut off in early manhood, but he has left the pleasant savour of a good and virtuous name.

Want of space compels us to postpone our Notices to Correspondents, and the usual list of Publications received.

Part First.

ORIGINAL COMMUNICATIONS.

Article I.—*Contributions to the Pathology of Morbid Growths.* By Charles Murchison, M.D., L.R.C.S.E., Ex-President of the Royal Medical Society of Edinburgh, and Member of the Botanical and Physiological Societies of Edinburgh.

That the study of the nature and structure of morbid growths is one of very great importance cannot for a moment be doubted, when we consider the numberless cases in which these affections, in one form or another, come under the notice of the surgeon and medical practitioner, and the vast amount of anxiety, misery, and pain, too frequently terminating only in death, which they inflict on the human race.

Till a very recent date our ideas as to the pathology of morbid growths were very vague and obscure. Within the last few years, however, great light has been thrown on the subject by the attention which has been paid to the investigation of the minute structure of all tissues, both healthy and morbid. By this a step has certainly been taken in the proper direction; for, as Dr Baillie, the eminent pathologist, has truly remarked, "A knowledge of morbid structure does not lead with certainty to the knowledge of morbid action, although the one is the effect of the other; yet surely it lays the most solid foundation for prosecuting such inquiries with success."

Much, however, still remains to be done, before our knowledge of the structure of morbid growths can be regarded as in any degree perfect; and this perfection, in my opinion, will be best obtained by the possession of numerous cases of such tumours, presenting any peculiarity in their minute structure, accurately and carefully described, along with illustrative drawings.

It is with this object in view, that I have resolved to lay before the profession the present series of observations, which I intend to continue, from time to time, according as examples shall present themselves for examination. I may remark, that many of the cases to be described were contained in an "Inaugural Dissertation," to which the Medical Faculty of the University of Edinburgh awarded a gold medal in August 1851.

These cases, I trust, will be regarded as a contribution to the series of facts, by means of which we will ultimately be enabled to arrive at a more correct knowledge of the pathological nature of tumours, than we at present possess, and as, therefore, of infinitely more value than any number of theories on a subject in regard to which facts are still wanting on which to build these. Dr Abercrombie has most truly remarked, that "recorded observations must form the only basis on which can be founded any legitimate principles in medical science."

The description of each of the following cases has been divided into three parts; the first giving a short *history* of the morbid growth, with the appearance presented by it before its removal from the body, in all cases in which this has been possible; the second, describing its appearance and *structure*, as seen by the naked eye, and with the assistance of the microscope; and the third, containing a few general *remarks* on the nature and peculiarities of the case in question. The histological description of each case is illustrated by woodcuts, after drawings sketched by myself from nature. These drawings have always been made to resemble as closely as possible the natural appearances presented by the morbid tissues.

The microscopic observations have been conducted with a compound microscope, manufactured by Messrs Smith and Beck, of London, and most of them with an object-glass of one quarter of an inch focus.

I may add, that in every case the morbid structure has been subjected to examination within thirty-six hours after its removal from the body.

CASE I.—*Cancerous Tumour of Lower Jaw—Removal of Symphysis of Jaw—Return of the Disease in the Neck—Death.*

History.—William M——, æt. 51, a labourer, was admitted into the Royal Infirmary on November 4th, 1850, under the care of Mr Syme. He stated that he had always enjoyed good health until ten months before admission, when, from a violent concussion in a railway carriage, his lower jaw received a severe blow from another man's head. Two of the incisor teeth were knocked out, and three others of the front teeth so loosened, that it was afterwards necessary to remove them. A few days after the accident, a swelling, attended with great pain, made its appearance in the hollow beneath the tongue. After some days this swelling was lanced by a surgeon, and about a tablespoonful of a dark bloody matter evacuated. This gave great relief to the pain; but in a short time a swelling re-appeared in the same place, which in a few days burst, discharging a thick purulent matter. This ulcerated opening had never closed up. Soon after, a firm swelling began to appear in the gums of the missing teeth, and gradually increased, projecting

backwards to the space beneath the tongue. On the patient's admission, the four incisor and the right canine teeth of his lower jaw were wanting. In the angle of the jaw beneath the tongue a tumour was seen, forming a prominence about the size of a plum. This tumour was immoveably attached to the jaw, appearing to take its origin from the empty alveoli. The consistence of the tumour was not firm, so that it retained an impression made with the finger on its surface. On its upper surface was an irregular ulcerated surface, about the size of a sixpence, presenting a dirty grayish aspect, and throwing off a very fetid discharge. The jaw, for about two inches on either side of the symphysis, was felt to be considerably thickened, this thickened condition extending as far as its lower margin. The man stated that he had never had much pain in the tumour, but its situation, and the fetid nature of the discharge, made him anxious to have it removed. It had already been burned with various caustics, without any beneficial result. There was no enlargement of any of the cervical glands, and, with the exception of the tumour, the patient seemed in the enjoyment of perfect health.

On the 16th of November, after the administration of chloroform, Mr Syme removed the symphysis of the lower jaw, with nearly two inches of the horizontal ramus on either side. A longitudinal incision was first made in the mesial line, through the lower lip and chin, down to the bone. The two flaps of soft parts were then dissected from off the bone, and division of the latter effected by means of the saw and bone-pliers. The tongue was tied forward to prevent its slipping back. After the removal of the bone, the edges of the soft parts were brought together again, by means of twisted and common sutures. On the 18th, the thread by which the tongue was held forwards became loose, yet the patient could swallow, and had no difficulty in controlling its motions. On the 20th, the sutures were removed, and the edges of the wound were found to have all united by the first intention. On the 9th of December, the man was dismissed from the hospital. For some days before, he had been walking in the open air. The divided ends of the lower jaw were covered with granulations, were quite in their natural position, and could be moved freely up and down. The man could articulate, eat, and drink, but could not protrude his tongue from his mouth. At that time there was no sign of any return of the disease.

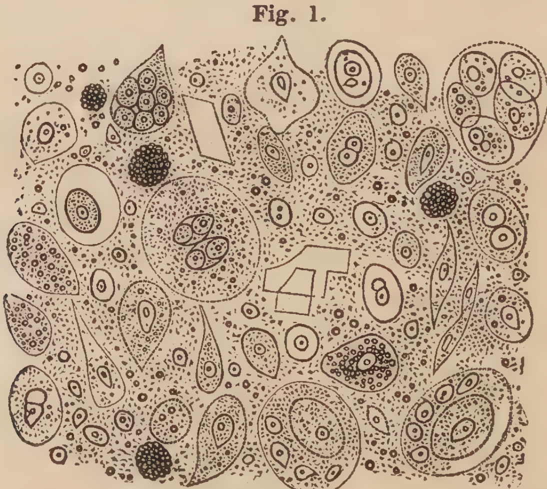
Nothing more was heard of this man for some months ; but, in the following summer, his wife came to the hospital, and stated that soon after her husband returned home, swellings appeared in various parts of the neck—increased in size with considerable rapidity, and were the seat of great pain, and that in May death put an end to his sufferings.

Examination of the Tumour after its Removal.—The tumour after removal was found to be of about the size of a dried fig, firmly at-

tached to the alveolar processes of the jaw bone, and projecting backwards, so as to fill up the angle formed by the junction of the two horizontal rami. It was of soft consistence, retaining an impression made with the finger; and there was a patch of ulceration, about the size of a sixpence, presenting an irregular surface and edges, of a dirty grayish colour, and emitting a very fetid discharge, in the epithelial membrane covering its upper surface. When the tumour was cut into, the cut surface was of a grayish-pink colour, and yielded, on scraping or squeezing it, a quantity of a thick dirty pinkish fluid. Its consistence was more or less elastic, but varied at different parts; generally speaking, it was firmer near its attachment to the bone than on its free surface; at one or two places, and particularly at the left extremity of its attachment to the bone, there were a few drops of a thick dirty reddish-brown puriform fluid. It contained no osseous spicula or bony matter in its interior. After dissecting the tumour from off the bone, no trace of the alveoli could be seen in the latter; but, on the upper margin of the jaw, there was a large cup-shaped cavity, bounded before and behind by the anterior and posterior laminæ of the bone, which were here far more widely separated than in the natural condition of the parts, fully four-fifths of an inch intervening between them at one part. This cavity extended downwards to within a third of an inch of the lower margin of the jaw. To the bottom and sides of this cavity, which presented a rough uneven surface, the morbid structure under consideration had been attached.

A drop of the fluid obtained from a freshly made section of the tumour was treated with a little water, placed between two glass slides, and examined under a microscope, with a magnifying power of about 250 diameters linear. It was found to contain the following elementary bodies. (Fig. 1.) In the first place, there were nucleated

Fig. 1.

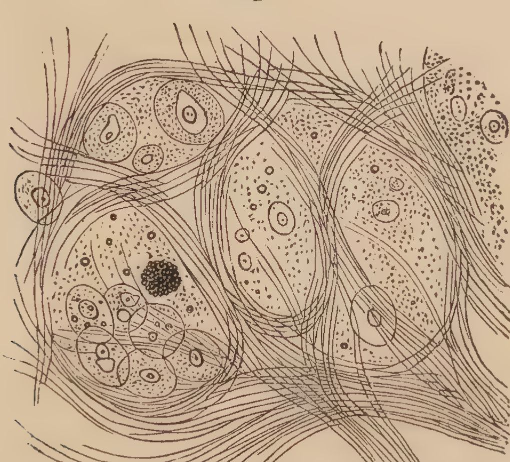


A drop of the fluid obtained from a fresh section of the tumour forming the subject of Case I., treated with diluted acetic acid.

cells of various sizes and in all stages of development; the largest had a diameter of fully $\frac{1}{300}$th of an inch; they were for the most part of

a rounded or oval form; some, however, had a pyriform, an elongated, or an irregular outline. A few of the cell walls were perfectly transparent; most of them, however, presented a very finely granular aspect. The addition of a drop of very diluted acetic acid dispelled this granular appearance; acid a little stronger dissolved them altogether, leaving the nuclei unaffected. These nuclei were mostly round or oval, with an average diameter of $\frac{1}{1600}$th of an inch, and contained in their interior one or more nucleoli. The number of these nuclei in each cell varied greatly; some of the cells were loaded with them, very many contained two nuclei set side by side, while in others there was only one; one cell was seen with two nuclei, each of which seemed to be splitting up into two others. Several large mother cells were seen with one or more nucleated cells in their interior, the spaces between the different cell walls often containing several nuclei and fine granular matter. Floating among these cells were numbers of naked nuclei, similar to those already described as existing in the cells. Some of these seemed to have, as it were, a transparent membrane rising from one of their surfaces. There were also a few compound granular corpuscles, or cells loaded with small globules of oil, but these were not numerous. Some of the large nucleated cells were observed containing a number of oil globules between the nucleus and cell wall, and there were others in which nothing but oily and albuminous granules could be detected, no nucleus being visible even after the addition of acetic acid. The above elements were mixed up with a quantity of granular and molecular matter, a few oil globules, and several scales of cholesterine. The reddish-brown puriform fluid contained a large amount of granular and molecular matter, and its cells were more irregular and broken down. The fluid taken from near the attachment of

Fig. 2.



The edge of a thin section of the tumour described in Case I., treated with acetic acid.

the tumour to the bone contained a quantity of mineral granular matter, dissolved by nitric acid, with the emission of small bubbles

of gas. A thin section was made, with a double-bladed knife, of the firmest portion of the tumour; and this, when treated with acetic acid, and examined under the microscope, presented an interlacing network of very delicate filaments, in the meshes of which were imbedded the cells and other structures already described. At one or two places the filaments seemed disposed in concentric circles, as represented in Fig. 2.

Remarks.—From the description which has been given of this tumour, and from the history of the case subsequent to the operation, no one, I think, will be inclined to doubt its cancerous nature. As an example of cancer in bone, it is of considerable interest, from the fact, that as yet we possess but few cases of cancer attacking this tissue, in which the structure of the morbid deposit has been carefully examined and recorded. Dr Bennett, in his "Observations on Cancerous and Cancroid Growths," (pp. 98, 100), has recorded two cases of cancer of bone, one in which the cancer existed in the phalanges of the fingers and toes, and resembled somewhat the structure of the tumour above described; and another of cancer of the sternum and ribs, in which the cellular element does not seem to have reached such a high stage of development. Lebert, in his recent work entitled "Traité des Maladies Cancereuses," mentions his having met with thirty-five cases of primitive cancer of bone, but he has given no detailed description of these cases, nor representations of their elementary structure.

The cells in this case of cancer presented, in a marked degree, the characteristics which have been attributed by Lebert, Bennett, and other authors, to the cancer cell; and such a case as this would tend to establish the doctrine of the former author as to the pathognomonic specificity of the cancer cell. If this doctrine were confirmed by observation in all cases, the study of morbid growths would be very much simplified: unfortunately, however, it is not. In future observations I shall endeavour to prove that no such specificity, as Lebert contends for, exists; and that every form of cell is met with in cancer, the tissue in which the cancerous deposit takes place, in some instances, seeming to exercise an influence over the form of the cell.

The presence of filamentous tissue in a case of cancer of bone is not without interest, from the fact, that some authors have considered it a necessary constituent of cancer. It is true, that, in the majority of cases of cancer, fibrous tissue does exist in greater or less quantity, yet still we do occasionally meet with specimens in which no trace of it can be detected, so that its presence cannot be said to be absolutely necessary to constitute cancer. Cases illustrative of this will be adduced in a future communication.

The presence of cholesterine, compound granular corpuscles, and a large quantity of albuminous and oily granules floating among the cellular elements, would seem to indicate that a process of disintegration was going on in the morbid tissue.

The absence of bony spicula in the substance of the tumour, and the fact of a large quantity of calcareous granules being detected along its line of attachment to the bone, confirms a statement made by Lebert, in reference to a distinguishing character between cancer of the periosteum and cancer in the interior of bone. The former, he says, gives rise to a sort of hypertrophy of the bone, numerous osseous spicula being developed in its substance, whereas the latter gradually destroys and removes the surrounding bony tissue.[1]

As to the mode of origin of this tumour, the patient attributed its growth entirely to the blow he had received on the jaw; and the fact of its taking its origin from the part which before the accident had been occupied by the teeth, renders this the more probable. Blows and other injuries we know to be frequent causes of the origin of all forms of tumours; and Dupuytren has recorded the particulars of a case very similar to the above, in which he removed the symphysis of the lower jaw, on account of a tumour, whose origin was attributed to a blow received on the chin three months previous to the operation. This tumour he designates osteo-sarcomatous, but from its description it seems to have been not unlike the one we have been describing. The operation was temporarily successful; but, as in the above case, the man died six months afterwards from a return of the disease.[2]

Case II.—*Fibro-Nucleated Tumour in Mammary Region—Excision —Recovery.*

History.—On the 7th of December 1850, Mr Syme excised a small tumour from the mammary region of a middle aged married lady. It was situated immediately underneath the integuments, two or three inches above and to the outside of the right nipple. It appeared to be of about the size and shape of a large pea, and had been growing for several months. It may be mentioned, that the lady was liable to the growth of encysted tumours in the scalp.

An incision was made through the integuments down upon the tumour, which was then grasped with a hook, and dissected out. The wound healed by the first intention.

Description of the Tumour after its Removal.—It was of about the size of a French bean, and of firm consistence. On section, it presented a grayish-white colour, and glistening surface. It contained no milky juice; but on scraping the surface of the section, a slight quantity of a watery fluid was collected on the edge of the knife, which microscopic examination showed to contain rounded and elliptical bodies like nuclei, having an average diameter of $\frac{1}{2400}$th

[1] Op. cit., p. 732.

[2] Dupuytren on the Diseases and Injuries of Bone, translated by the Sydenham Society, p. 416.

of an inch. (Fig. 3.) These bodies were transparent, but presented a well-marked outline, and most of them contained in their interior one, two, or more rounded granules. They were seen either

Fig. 3.

Fig. 4.

Fig. 3.—Nuclei, etc., found in the fluid obtained by scraping the surface of a fresh section of the tumour.
Fig. 4.—A thin section of the tumour made with a Valentin's knife, treated with acetic acid.

isolated or adhering by their edges in small masses. The action of acetic acid seemed to produce little or no change upon them. Along with these bodies was a small quantity of fine granular matter. A thin section of the tumour, made with a Valentin's knife, treated with acetic acid, and compressed between two glass plates, was found to consist of a stroma of white fibrous tissue, interspersed through the filaments of which were a number of the nuclear bodies above described, the whole presenting an appearance similar to what is represented in the accompanying figure. (Fig. 4.)

Remarks.—This interesting tumour, consisting of nuclei interspersed through a stroma of white fibrous tissue, would seem to belong to that class of morbid growths which Professor Bennett has recently described under the name of fibro-nucleated tumours. Professor Bennett, in his "Observations on Cancerous and Cancroid Growths," records three examples of this form of tumour; one occurring in the thigh (Ob. XXXIV.), another in the parotid gland (Ob. XXXVII.), and a third in the soft parts of the upper arm (Ob. XLVII.). The structure of these tumours, as ascertained by microscopic observation, presented a very close resemblance to what has just been described. But though I have denominated this tumour by the term fibro-nucleated, from its intimate resemblance to the tumours described under that name by Professor Bennett, it is not without considerable doubts as to the propriety of separating the so-called *fibro-nucleated* tumours into a class distinct from that of *fibrous* tumours. Naked nuclei interspersed among the fibres are present in greater or less quantity in most fibrous tumours; and, indeed, Vogel remarks:—"In none but mature and perfectly-formed tumours are nuclei ever absent."[1] It is true, one may form a dis-

[1] Vogel's Path. Anat., translated by Day, p. 216.

tinction between tumours which consist of fibrous tissue formed by the splitting up of the walls of nucleated cells, the nuclei of which may remain imbedded among the filaments, or may ultimately disappear, and those which are formed by nuclei and nuclear fibres without the intervention of cells; and this I believe is the distinction which Professor Bennett draws between fibrous and fibro-nucleated growths. Now, nuclei may form fibrous tissue in one of two ways. The nuclei may elongate, and become themselves transformed into fibres; the fibres developed in this way, however, are of the yellow elastic variety,[1] while the fibres of all the fibro-nucleated tumours described by Professor Bennett, and examined by myself, belong to the white variety, and must have been developed by the other process,—viz., by the nuclei elongating and splitting up a surrounding hyaline substance into delicate parallel filaments. But, in the case of a tissue, composed of white fibres with interspersed nuclei, it would in most cases be very difficult, if not impossible, to determine whether the nuclei are those of cells whose walls have become elongated and split up into fibres, or whether they are nuclei which have split up into filaments a previously hyaline matrix. The absence of all vestiges of cells in the latter case is not a sufficient ground of distinction, for even in ordinary fibrous tumours, all traces of the original cell structure may have quite disappeared; and, indeed, in the same tumour, we may have at one part a tissue consisting entirely of filaments and nuclei, *without* any cells; and at other parts, of nucleated cells becoming transformed into fibres. Cases illustrative of this will be recorded in a future communication. Dr Bennett himself allows that there are transition varieties between the fibro-nucleated and true fibrous tumours. Thus, of the four cases recorded in Obs. XXII., XXIII., XXIV., and XLIII., he states that they were probably instances of the fibro-nucleated tumour, although in them the nuclei seemed to have passed here and there into fibro-plastic bodies, "exhibiting a transition stage between the fibro-nucleated and the purely fibrous cancroid growths."—P. 178.

For my own part, I am inclined to consider the distinction which has been drawn between fibrous and fibro-nucleated tumours as in a great measure arbitrary; and that the latter are only a variety, or, perhaps, more correctly speaking, a particular stage, in the development of the former. The subject, however, well deserves further investigation, as does also the mode of development of fibrous tissue generally.

[1] This view, as to the development of yellow elastic fibrous tissue, was first promulgated by Henle, and is the one generally adopted by physiologists. I may mention, however, that some recent investigations of Mr James Drummond, of Edinburgh, on the Development of the Ligamentum Nuchæ, throw some doubt on Henle's view, and would seem to render it probable that cells, as well as nuclei, take part in the development of yellow elastic fibres.

CASE III.—*Fibro-Nucleated Tumour of the Soft Palate—Excision—Cure.*

History.—Catherine B——, æt. 25, a servant, was admitted into the Royal Infirmary, under the care of Mr Syme, on the 21st of January 1851, on account of a tumour of the soft palate, situated between the uvula and left tonsil. The mucous membrane at this point was seen to be slightly prominent, and very red and vascular. This tumour had been growing for twelve months. When first observed, it was a mere pimple; but latterly it had increased considerably in size, and on admission was felt to be of about the size of a cherry. It was at times the seat of considerable uneasiness. On January 24th a hook was inserted into the mucous membrane over the tumour, and then cut out so as to expose the surface of the latter. The hook was then inserted into the tumour itself, which was dissected out. With the exception of a considerable hemorrhage from the wound some days after the operation, it healed without any bad symptoms.

Examination of the Tumour after its removal.—It was of about the size of a small "marble." Its form was almost globular, but slightly longer in one direction than the other. It was of firm consistence. When a section was made through its centre, the cut surface was smooth, and of a dirty whitish colour. No milky juice exuded on squeezing; but, on scraping the surface of the section, a small drop of a watery slightly viscid fluid was collected on the knife's edge. On placing this under the microscope there were detected in it numerous minute bodies, which seemed to be of the nature of nuclei. (Fig. 5.) These were for the most part of a

Fig. 5.

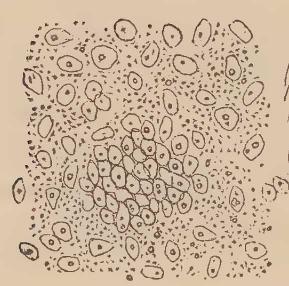


Fig. 6.

Fig. 5.—Appearance presented under the microscope by a drop of the fluid, obtained by scraping the surface of a fresh section of the tumour.
Fig. 6.—The edge of a thin section of the same tumour.

rounded form; a few were elliptical, or even still more elongated. Their average diameter measured about $\frac{1}{2800}$th of an inch. They were of a grayish colour, and but little affected by the action of

acetic acid. Each contained in its interior one or more minute rounded granules. These bodies were seen either isolated or adhering by their edges in small masses. Along with them was a considerable quantity of albuminous molecular matter. On making a thin section with a double-bladed knife of the solid portion of the tumour, washing it well with water, and then adding to it a drop of acetic acid, it presented under the microscope an appearance similar to that shown in Fig. 6,—a fine fibrous tissue, with nuclear bodies, like those just described, interspersed among the filaments.

Through the whole substance of the tumour, there was a pretty dense network of capillary blood-vessels.

Remarks.—In structure, this tumour bore a very close resemblance to the one last described, differing only in the nuclei being of smaller size, and of a more rounded form. Like the preceding, it evidently belonged to Professor Bennett's class of fibro-nucleated growths, concerning which we have already treated (see Remarks on Case II). The peculiarity of its situation, which is a rare one for any form of growth, added additional interest to it.

Case IV.—*Osseo-Cartilaginous Body in the Knee-Joint—Excision —Death.*

History.—On the 7th of September 1848, M—— D——, æt. 19, a female servant, was admitted into the Royal Infirmary, under the care of Mr Syme, with symptoms of a moveable body in her left knee-joint, which had commenced seven months before admission. She complained of fits of the most agonising pain in the joint, generally supervening quite suddenly, especially whenever she attempted to walk, so that she was obliged to give up her situation. The body was quite moveable, but was generally situated at the inner part of the joint, where it could be felt through the soft parts, apparently of about the size of a large pea. Mr Syme made various attempts first to remove the body by subcutaneous incision of the synovial membrane; and, this failing, he endeavoured to make its position fixed, by transfixing it with a needle, and retaining it so transfixed for three weeks at a time. All these means failing, however, to afford relief, Mr Syme not having then adopted the mode of operating he has since had recourse to, on the 23d of December made a direct incision down upon the body, and removed it. Next morning there was violent inflammation in the knee, accompanied with general febrile symptoms. This resisted all the means employed to check it; the joint swelled, the whole limb became œdematous, the inflammatory fever gradually passed into irritative fever and hectic, and the patient expired on the 29th of February 1849.

Mr Syme presented me with the loose body on the day on which he removed it; and the following description, with the drawings,

formed part of a communication read by me before the Edinburgh Royal Medical Society, March 30, 1849.

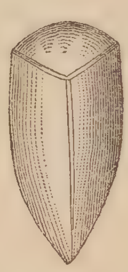
Examination of the Body after its removal.—It was two-thirds of an inch in length and one-third of an inch in breadth at its broadest end. It was of a somewhat pyramidal form, having three sides gradually tapering to a point at one extremity, and truncated at the opposite, as is represented in the annexed woodcuts. (Figs. 7 and 9.)

Its external surface was smooth and glistening, like that of an articular cartilage, and to all appearances was covered by a thin membrane, which originally had been a reflexion of the synovial membrane of the knee-joint. I was not able, however, to effect a separation of this membrane from the subjacent texture. Attached to a slight depression in the middle of one of the triangular surfaces of the body, was a small shred of membrane, by means of which it had probably at one period been connected to one of the various surfaces entering into the formation of the joint. A transverse section of the body showed that two distinct structures entered into its composition, one of these resembling cartilage the other bone. The former did not completely envelope the latter, but was only laid on, as it were, on one side of it. (See Fig. 8.) There

Fig. 7.

Fig. 8.

Fig. 9.



Figures 7 and 9 show the pyramidal shape of the body. The drawings are somewhat larger than the natural size.

Fig. 8 represents a transverse section of the body, showing the position of the cartilage upon one side of the bony matter, and the shred of membrane attached to another surface.

appeared to be a distinct line of separation between the two. The cartilaginous substance, which to the naked eye closely resembled articular cartilage, was found on microscopic examination to be composed of a transparent slightly granular matrix, in which were imbedded nucleated cells, exactly similar to the elongated cells met with in the costal cartilages. (Fig. 10.) But the most interesting structure was that of the bony matter, which possessed Haversian canals, concentric lamellæ, lacunæ, and canaliculi, in all respects resembling those met with in true bone, except that the canaliculi were not so distinctly marked. The presence of Haversian canals in the bony matter necessarily implied the existence, at one time, of blood-vessels. (Fig. 11.)

Fig. 10.

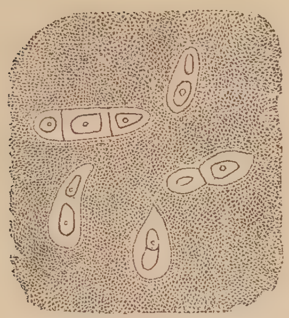


Fig. 11.

Fig. 10.—A thin section of the cartilaginous substance, showing nucleated cells imbedded in a granular matrix.

Fig. 11 represents a portion of a thin slice of the bony matter, with the Haversian canals, lacunæ, and canaliculi. The last have been represented as too distinct.

Remarks.—Loose bodies have been found within the capsules of all the large joints of the limbs, with the exception of that of the hip. They have also been found within the capsules of the articulations of the lower jaw, but by far their most common site is that of the one just described within the capsule of the knee-joint. The structure of these bodies varies; sometimes they consist entirely of a substance like cartilage, at other times there is a bony nucleus in the centre of the cartilaginous mass; while at other times, as in the above case, bony matter constitutes the greater part of their bulk. The fact of the bony matter in this case presenting the structure of true bone is not without interest, as it has been generally believed that the calcareous matter is deposited in an amorphous manner, or, in other words, that it is an unorganised formation, deposited from a mother liquid; whereas in the above case the bony matter was an organised and analogous formation, deposited from a cyto-blastema. The structure of the body may to some extent serve to explain its mode of origin and formation. Various opinions have been entertained as to the manner in which these bodies originate. Some, as Munro,[1] have maintained that they were pieces of cartilage, broken off from the articulating surfaces of the joint. Bichât thought they were portions of the synovial membrane transformed into cartilage. Sander[2] regarded them as "precipitates from the synovia;" and Richerand[3] has described them as partly *inorganic* concretions of the synovia, and partly *organic* formations springing from the synovial membrane. Hunter[4] supposed that they were extravasations of blood, which had become organised into a structure resembling that of the part to which they were connected. Lænnec[5] believed that these bodies were

[1] Medical Essays and Observations of Edin., vol. iv., p. 244.

[2] Dic. des Sciences Médicales, iv., p. 127.

[3] Nosographie Chirurgicale, ii., 349.

[4] Transac. of Society for Improvement of Medical and Surgical Knowledge, vol. i., p. 229.

[5] Chelius' System of Surgery, translated by South, vol. ii., p. 707.

formed on the outer surface of the synovial membrane, and gradually forced their way into the cavity of the joint, the synovial membrane covering them yielding and forming a pedicle by which they are attached. The theory of Lænnec which has been last mentioned is the one which, in my opinion, approaches most nearly to the truth; for it explains in a satisfactory manner the structure of the body above described, as will appear from the following considerations :—

1. This body, like all others found in the joints, presented externally a smooth serous-like surface, exactly like that of the synovial membrane.

2. Bodies, similar to the above, are often found, not loose in the cavity of the joints, but attached by a pedicle to some part or other of the synovial membrane; and in the above case, though the body was quite free, the remains of the pedicle by which it had been attached might still be made out.

3. The true bony structure described above could only have been developed in one of two ways. It may have originated from a proper ossifying point, as when temporary cartilage is converted into bone. This, however, seems far from probable, and I think that the only other feasible explanation of its presence is, that it originated as an abnormal growth,—a small exostosis, so to speak, of one of the articulating surfaces entering into the formation of the joint, which in the progress of its growth pushed before it the cartilage and synovial membrane, till at last it was only attached by a membranous pedicle of the latter, and ultimately, from the rupture of this pedicle, it became quite free in the cavity of the joint. The peculiar position of the cartilage on one side only of the body seems to favour this view. Of course, this mode of formation will not be applicable to those bodies which may be found attached to portions of the synovial membrane not covering the articulating surfaces, but it would be interesting to ascertain if these ever contain the structure of true bone. I am not aware of this having been detected in any such case, and I should be inclined to doubt if it ever exists.

CASE V.—*Ulcerated Congenital Cartilaginous Tumour (Enchondroma) of Middle Finger—Amputation of Finger—Recovery.*

History.—P—— S——, æt. 12, a fisherman's son, from Shetland, was admitted into the Royal Infirmary on the 21st of October 1851, on account of a large tumour in the proximal phalanx of the middle finger of the left hand. This tumour was of a globular form, and of about the size of an orange, projecting principally on the dorsal aspect of the phalanx. The patient stated that this tumour had existed at the period of his birth, but that its growth had latterly greatly increased in rapidity. About three weeks before admission, a small pustule formed on the skin covering

the more prominent part of the tumour. After a few days this "broke," leaving an ulcerated surface, which rapidly extended, until at the time of admission it was considerably larger than a penny-piece. The surface of this sore presented a dirty grayish aspect. There was but little discharge, and no blood had escaped from it. The consistence of the tumour was firm, with here and there a peculiar elasticity, especially near the ulcerated part. The tumour was firmly attached to the proximal phalanx, and seemed to spring from its substance. The two distal phalanges, as also the corresponding metacarpal bone, were quite uninvolved. Through the skin covering the tumour might be seen a network of large veins. The patient had never complained of any pain in the tumour, even when it was pressed upon with considerable firmness. He had no other swelling in any part of his body, and was in the enjoyment of excellent health.

On the day after admission, chloroform was administered to the patient, and the finger with the tumour was amputated at the metacarpo-phalangeal joint in the ordinary manner. Five arteries required to be tied. The edges of the wound were kept in apposition by tying together the fore and ring fingers, and by compresses of lint.

No untoward symptom supervened upon the operation, and by the end of three weeks the wound had perfectly healed, and the patient was dismissed cured.

Examination of Tumour after removal.—Its weight was 5 oz. avoirdupois. No difficulty was experienced in removing the integuments from the surface of the tumour, which then exhibited a smooth glistening aspect, as if it had been enveloped in a serous cyst. It appeared to take its origin from the dorso-ulnar aspect of the phalangeal bone, which was considerably distorted from its normal shape, being concave towards the aspect of the tumour, and convex in the opposite direction. The extensor and flexor tendons were correspondingly distorted in their course. On cutting into the tumour, it was found to extend into the central medullary cavity of the bone. The external bony laminæ were expanded over a considerable portion of its surface, gradually becoming thinner and thinner towards its more prominent part, where there was only a thin fibrous sheath, and at the ulcerated part even this was wanting. At several points, chiefly in the neighbourhood of the expanded osseous laminæ, this enveloping sheath presented a density and structure not unlike those of articular cartilage. From this external envelope a number of ramifying septa passed inwards through the substance of the tumour, dividing it into numerous polygonal compartments, of about the size of small peas. Like the external envelope, the structure of these septa was partly fibrous and partly cartilaginous; and in many of them there was calcareous matter, especially near the attachment of the tumour to the bone; in the medullary cavity of the phalanx, the proper substance

of the tumour was contained in little cavities hollowed out in the texture of the bone. These septa pervading the tumour were very vascular, so much so, that at some parts they appeared to the naked eye like red lines. The compartments formed by these septa were filled with a substance of a light pinkish colour, translucent lustre, and of the consistence of a firm jelly. The substance of the tumour gradually became softer in the direction of the ulcerated surface, and for about one-fifth of an inch beneath the surface of the ulcer its colour was a dirty yellow.

A minute particle of the translucent substance from the centre of the tumour was compressed between two glass plates, and examined with the microscope, with a power magnifying about 250 diameters linear. It was then seen to consist of transparent nucleated cells, imbedded in a structureless hyaline matrix. A few of these cells are represented in Fig. 12. They were of very

Fig. 12.

Fig. 12.—Nucleated cells, composing the gelatinous substance.

various forms, as round, elliptical, pyriform, and fusiform, while a few were caudate, having one or more long filamentous processes passing from one of their extremities. Several of these cells were observed with a diameter of $\frac{1}{450}$th, but their average diameter did not exceed $\frac{1}{800}$th, of an inch. Each cell contained in its interior a single, rounded, opaque nucleus, from $\frac{1}{2500}$th to $\frac{1}{3000}$th of an inch in diameter. Diluted acetic acid rendered the cell walls somewhat more transparent, but produced no change on the nuclei. A particle of the yellowish softened portion of the tumour was found to contain cells similar to the above, but exhibiting an irregular shrivelled outline, pus corpuscles, oily globules, and a large quantity of granular matter. (Fig. 13). The structure of the gristly portions of the external envelope and the septa resembled precisely that of the translucent interior, with this exception, that the containing matrix exhibited a finely granular, in place of hyaline, aspect.

Fig. 13.

Fig. 13.—Nucleated cells, pus corpuscles, oil globules, and granular matter, obtained from the softened portion of the tumour.

Remarks.—This tumour was a good example of that class of morbid growths which, from Müller, have received the name of *Enchondromata*,[1] occurring, too, in a situation in which these tumours are not unfrequently met with. It consisted essentially of two parts—a firm membranous interlacement, some parts of which were of a cartilaginous or osseous texture, arranged so as to form areolar spaces, which enclosed the other constituent of the tumour, —a translucent gelatinous substance, consisting of nucleated cells, imbedded in a hyaline matrix. The tumour seemed to have taken its origin in the medullary cavity of the bone, and in its growth to have gradually expanded the osseous laminæ over its surface, found its way through these, and at length, from the great tension consequent on its size, produced ulceration of the super-imposed integuments, this ulceration with softening extending to the proper substance of the tumour. The fact of the tumour being congenital is not without interest. The nuclei of the cells found in the above described tumour underwent little or no change from the action of diluted acetic acid. In this respect they afforded a striking contrast to the nuclei of cells described by Professor Bennett as existing in an enchondroma of the humerus, which, on being treated with acetic acid, became so pale that nothing but their outline was discernible.[2]

Case VI.—*Atheromatous Cyst on the Back—Tapped—Injected with Iodine—Recovery.*

History.—Mr ——, a gentleman, upwards of sixty years of age, consulted Mr Syme, in the beginning of November 1850, in reference to an immense tumour on his back, so large, that when he was dressed it gave his back the appearance of being very much bent forwards.

[1] On the Nature and Structural Characteristics of Cancer. By J. Müller. P. 96.

[2] Op. cit., p. 110.

This tumour had been gradually increasing in size for the long period of forty-six years, though with much greater rapidity during the twelve months previous to the patient's application to Mr Syme. Mr M—— attributed its origin to a severe strain in the lower part of his back, which he received while playing at the game of "leap frog." The tumour was of a somewhat circular outline, but its margin was not very well defined; it covered almost the whole posterior lumbar region, extending from the sacrum almost as far as the lower angles of the scapulæ. Its surface was convex, with a few irregular depressions and elevations; it was far more prominent at the lower than at the upper part. The whole tumour had a distinctly fluctuating feel, and, on tapping, an impulse was distinctly conveyed from one side to the other.

A small trocar was plunged into the most dependent part of the tumour; a few drops of a thick yellowish fluid escaped through the canula, and, after introducing a probe, about two fluid ounces more came away; its consistence, however, was so thick that no more would flow through the canula. This was, therefore, withdrawn, and with a probe-pointed bistoury an incision, half an inch long, was made into the tumour. Through the opening thus made the contents of the cyst were slowly evacuated. The walls of the cyst were at first allowed to collapse of themselves, but when they were nearly emptied, pressure was employed in such a manner as to exclude the entrance of air. A pad of lint was placed over the wound, and a broad bandage round the loins.

After some days there was a slight re-accumulation of fluid in the cavity. This was drawn off, and two fluid drachms of pure tincture of iodine injected; and after some days more a whole fluid ounce of the tincture was thrown in. This produced considerable redistention of the cavity, but remarkably little disturbance of the system. The swelling, after some time, began to diminish, and there now remains only a slight fulness in the region of the tumour.

Examination of the Contents of the Cyst.—These, when measured, were found to amount to 140 fluid ounces. In colour and consistence, the fluid very closely resembled ordinary pus; but, on close inspection, it presented a very remarkable appearance, from there being suspended in it an immense number of translucent gelatinous-looking bodies, varying in size from that of a cherry to that of a millet-seed, or less. A drop of the fluid, when subjected to microscopic examination, was found to consist of globules, of an oily nature, with a large quantity of scales of cholesterine. (Fig 14.) The latter were remarkable for their great size, some single scales measuring $\frac{1}{120}$th of an inch. Here and there might be seen a few pus corpuscles ($\frac{1}{3000}$th of an inch), exhibiting, after treatment with acetic acid, a two or three-lobed nucleus. There was also a considerable number of compound granular corpuscles. One of the

small gelatinous-looking bodies, when examined with a low magnifying power, was seen to possess a distinct external cyst, containing a quantity of molecules and granules, of an oily nature, which escaped on rupturing the cyst by pressure. The cyst itself appeared quite structureless. In one or two of them there was something like a fine fibrous structure, an appearance, however, which careful

Fig. 14.

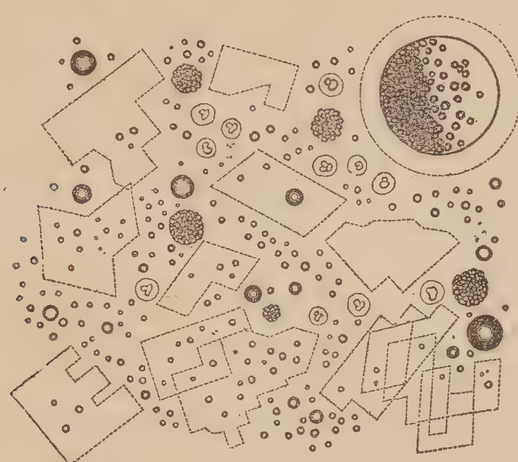


Fig. 14.—Cholesterine, oil globules, compound granular and pus corpuscles, found in a drop of the fluid. Along with these is represented, at the upper and right hand corner, one of the peculiar cysts described in the text, not nearly so highly magnified as the other elements of the fluid.

examination showed to be owing to creasings of the cyst when ruptured and evacuated of its contents. The cysts disappeared under the action of strong acetic acid, allowing the oily matter to escape.

Remarks.—The above is a good example of a cystic tumour with atheromatous contents, resembling in some respects the class of tumours designated by Müller by the term Cholesteotoma, but certainly not agreeing in every particular with the characters he assigns to this class. Thus Müller, in his description of it, says:—"Its consistence more resembles lard than fat, and it presents on section a lustre not unlike mother-of-pearl. Its chief peculiarity is, that the fat *cells* composing it are arranged in concentric laminæ, separable from one another," etc.[1] This tumour is rather referable to the class of true encysted tumours, the cyst in this instance containing a large quantity of oily matter and cholesterine. Professor Bennett[2] has described cysts containing such contents as the cholesteotoma of Müller. The above extract, however, from the translation of Müller's work, is sufficient to show that the tumour alluded to by that author is of a very different nature.

The transparent cysts, containing oily matter, found in this encysted tumour were very peculiar, and, so far as I am aware, have

[1] On the Nature and Structural Characteristics of Cancer. By J. Müller. Translated by Dr West.

[2] Op. cit., p 105.

not before been met with, or at all events described. In appearance they were not unlike some forms of hydatids, but the nature of their contents seems to forbid their being regarded in this light. The existence of the pus corpuscles renders it probable that the walls of the cyst had taken on an inflammatory action. Independently of its peculiar contents, this tumour is well worthy of notice from the lengthened duration of its growth, and the immense size which it attained.

ARTICLE II.—*Practical Remarks on Insanity as it occurs among the Inhabitants of Bengal.*[1] By THOMAS A. WISE, M.D., late Surgeon H.E.I.C. Service.

THE attention which has in Europe been paid to the subject of mental derangement, and the success which has attended these investigations, has induced me to avail myself of favourable opportunities, while superintending the insane asylum of Dacca, to determine whether the dark races of man are susceptible of the mental and moral influences necessary to the production of the various forms of insanity ; the modifications which they exhibit from peculiar characters, manners, and customs ; and whether they are relieved by proper training, and cured by the same plan of treatment as is successful in Europe.

It has been alleged that insanity is almost unknown in uncultivated countries, and, like a curse, is only attendant on the complication of civilisation and commerce.[2] Were this statement correct, few insane patients would be found in Bengal, where so many of the natives are quite illiterate : during one year I carefully examined the new admissions into the Dacca asylum, and out of two hundred patients, I found only five could read and write, and that very imperfectly. So that they might be considered as quite illiterate, and perhaps in a lower state of mental development than even the rudest savage, who, being generally surrounded with enemies, and obliged to guard against the ferocity of the inferior animals, as well as the cruelty of his own species, requires a certain degree of mental development and bodily strength to defend himself from his enemies, and to insure food for his own existence. The present rulers of India have afforded the inhabitants sufficient security from their enemies, and subsistence is obtained for their families, by one or two days' work in the week ; so that their chief mental exertions are employed in defending their property

[1] The term insanity comprehends, according to the Hindu law, not only madness and idiocy, but all those who labour under any species of fatuity, and who are naturally destitute of power of discriminating what may, or may not be done.—*MacNaughton's Principles of Hindu Law,* vol. i. p. 121.

[2] See J. S. Bell's Residence in Circassia.

from their neighbours, and indulging their great love for litigation. In a country in which the mental faculties are so very little cultivated, we might, therefore, expect to find very few insane patients, which is not the case. This will become more evident as our knowledge of these countries extends, and more attention is paid to the subject.

Thus, let us compare the number of the insane with the census of the inhabitants; and suppose that, in Ceylon, there are from 120 to 130 insane patients under treatment, and from 400 to 500 lunatics in the island. In the circle of Bengal districts, from which lunatics are sent to the Dacca asylum, 157·5, the average of four years, may be supposed to be under treatment, and probably from 2000 to 2500 is the actual number of lunatics. The following is an approximative comparison with the returns from England and Wales :—

	Population.	Lunatics.		Per Cent.
		Under Treatment.	Probable Actual Number.	
Island of Ceylon ...	1,009,008	125·[1]	450	·00446
Dacca Circle.........	9,891,484	157·5[2]	2000	·00202
England and Wales.	17,905,831	13400·[3]	13,400	·00754

This statement indicates the fact, that in Ceylon there are more lunatics than in the less civilised country of Bengal; and this number is greater in England, where the passions are more excited, and where "nervous diseases have increased by the irregularities of the circulation, connected with high civilisation, and intellectual culture;"[4] which bears out the melancholy result of Sir A. Halliday's experience, that the number of the insane in England has "become more than tripled during the last twenty years."[5]

Although intimately connected with the educational department of the Bengal government during a long series of years, I never knew of a well-educated native becoming insane. The same is found to be the case in civilised countries.[6] I have, however, known several melancholy examples of insanity in young natives of India, produced by intense application, and the vicious native system of learning by rote, etc., and one or two examples of symptoms of softening of the brain supervening on too sudden and intense study, at the government colleges, which required the individuals to dis-

[1] Davis, p. 35. [2] Dacca Lunatic Asylum Returns.
[3] Sir A. Halliday's Letter to Lord Seymore.
[4] Conolly on Insanity, p. 495.
[5] Sir Andrew Halliday's Letter to Sir Robert Seymore. Underwood, 1829.
[6] Conolly, l. c. p. 192.

continue their studies; still, I consider a regular and judicious cultivation of the mind, as one of the best means of preventing insanity.

The Hindus, like many other peoples, usually consider the insane and the deformed, as divinely favoured, and protected. "The lamp" of the madman is said "to be out," and the soul, at certain phases of the moon, is supposed to return to the great god *Mahadeva:* this is called "the hour of folly." Other rude nations suppose that certain forms of insanity are produced by devils, or evil-disposed spirits. The consequence of a belief in such fancies is, that while some have a strong prejudice against sending their relatives from home, to which they are supposed to bring prosperity, and particularly to an asylum where they are believed to be harshly treated; other families attach a degree of shame to insanity, especially should the patient be a female of good extraction, and there is, consequently, a desire to bury her existence in oblivion. It is therefore the wish of many, to keep the insane members of a family in their own homes, unless when they become very troublesome. When the members of the family are poor, they usually neglect their insane relatives, who receive food from the charitable, and are generally allowed to wander about, until the disease is incurable, or until they have injured some one; when they are sent by the police to the district jail, where a ward was formerly appropriated for them. This plan has been changed, and capacious asylums for the insane have been formed in central positions in India, to which those of the neighbouring districts are sent. The Dacca asylum receives patients from ten districts, including Assam; and they often arrive without the physician even knowing their names, or past habits; or whether it is the first attack, of a few days' standing, or a confirmed and hopeless case of long duration. So that all statistical calculations must be considered as approximative rather than exact. Very few of their friends or relations will even take the trouble to furnish any particulars of the lunatics, so that little can in general be gleaned of their previous history, unless a few faint traces of the past may sometimes be obtained from the recollections of an individual, on his recovery.

The general result of my experience is, that mental diseases are rarer, and less acute in their form, among the Hindus, than in the more civilised countries of Europe; probably from the more artificial manners and customs of a civilised state of society. But, in Hindustan, the frequent use of narcotics, particularly of gunjah, or extract of Indian hemp, and the more free introduction of spirits,—the great curse of more intimate connection with European nations,—is probably the cause of mental diseases being on the increase in that country.

The following practical remarks will be arranged under the heads of causes, symptoms, classification, and treatment of the insane, as they appear in Bengal:—

From the manner in which patients are forwarded to the Insane Asylum, we have seldom the means of forming a correct judgment of the *causes* which have led to the production or development of the disease. To meet this difficulty, I made a careful examination of each insane patient in the asylum (1849); and have noted such particulars as I could gather from his relations and friends. The result was, that out of those treated during the year, there were in the asylum 123 patients, the cause of whose malady was unknown, or to which fictitious reasons were assigned. The causes of the other patients' insanity may be arranged according as they were predisposing and exciting.

To the former causes belong hereditary influence, sex, age, and season. *Hereditary cause* may be, the father or mother being insane at the time of, or previous to, conception; when blood-relations are insane; when any member of the family is remarkable for eccentricity, or violence of character. It may likewise be produced when either parent has suffered from nervous diseases, or has committed suicide, or has been addicted to drinking, or when there is a great disparity of age between parents. In Bengal, traces of this hereditary predisposition among the insane can seldom be detected, perhaps from our knowing so very little of the previous history of such patients, as it is often considered a disgrace to the family, and is rarely acknowledged.

From the records of the asylum, which embrace a period of twenty-five years, out of 2,800 patients, seven persons appear to have been affected from a hereditary taint. In one case, a father and his two sons; in another case two brothers; in a third three brothers, were insane. In all these cases the patients were afflicted with dementia, were all about the middle age, and the attacks were produced without any known exciting cause. Two of the patients soon got well, and five remain under treatment, with no prospect of a speedy cure. From the above cases, it appears that the hereditary predisposition to insanity is not, perhaps, so great among the rude inhabitants of Bengal as in Europe; or that civilisation has a tendency to strengthen such a disposition to disease.

Sex.—The proportion of insane males to females, is about four of the former to one of the latter. But this gives an uncertain indication of the relative frequency of insanity in the sexes: as nearly all the women received into the asylum belonged to the lowest ranks of society, had been prostitutes, exposed to great privations, and previous attacks of disease. It is also believed that, from family pride, the insane female is confined at home, rather than allowed to become an inmate of a lunatic asylum. Females are in general less exposed to the influence of the weather, to indulge in the excitement of the passions, to the pernicious use of gunjah, etc.; which have all an influence in producing insanity.

Age.—More than two-thirds of the cases of insanity in the asylum occurred between the age of thirty and forty. There were only two

instances of patients being so afflicted before the age of twenty; and the cases after forty were from the pernicious use of gunjah.

Seasons.—The greatest number of insane patients are brought to the asylum between the months of April and November, which embrace the hottest months of the year; the largest proportion of recoveries occurs during the cold months; and the most fatal months are from July to January, which embraces the most unhealthy season of the year. Hence we may conclude, that the great heat of the weather has an influence in producing insanity, so that when the hot weather occurs suddenly, the number of admissions is increased, and is diminished by a long course of cold weather, during which the system is invigorated.

Careful observations have convinced me that, in the humid atmosphere of Bengal, the influence of the moon upon the paroxysms of insanity is considerable.

The Exciting Causes of Insanity.—These are,—excess in study, grief, the habitual and excessive use of intoxicating liquors or drugs, and the animal passions.

In an unhealthy climate like Bengal, where the mental faculties are little exercised, the offspring participate in the weakness of the brain, which, under ordinary circumstances, continues through life. Should a delicate youth, without any preparatory training, be suddenly and closely employed in mental occupation, his faculties become weakened, instead of being strengthened by the unusual exercise; and if the system be persisted in, headaches, visions, stupidity, and loss of memory, will be the consequence, and will terminate in fever, insanity, or death. Those youths who study longest, and exert themselves in the higher branches of European learning, are more subject to be thus affected, than the dull, who have proceeded but a short distance in mental studies. A still more pernicious study is that of Sanscrit philology, or Arabic theology, as the whole is acquired by rote, in a language which the pupil in general does not understand. Hence the memory is alone exercised, and the higher faculties of reason, judgment, etc., are entirely neglected.

Mahammud Agem, a sickly youth, twenty years of age, became a disciple of a fanatic, and, under his guidance, was taught Persian and Arabic. The Koran and other works he learned by rote, so that his memory was fatigued without his understanding being enlightened: inheriting a weakness of the mind from the total want of intellectual culture of his parents, he became disturbed in his sleep—saw visions—and became alarmed by the appearance of devils, who threatened to punish him for not performing some fancied work. The studies being continued, he became insane, and was then sent to the asylum. He at first refused to eat, and milk was injected into his stomach. He soon improved in health, took much exercise,—and by the relaxation of the mind, change of residence, and the healthy atmosphere of the asylum, he soon got well.

Grief.—In no case did the insanity appear to have been caused by a sudden excess of joyous emotions; whereas in several it appeared to have been produced from depressing causes. In five, the first derangement of the mental faculties appeared to have been immediately and decidedly connected with losses in trade; in nine males and one female, from the delays, or supposed injustice of courts of law or of oppressors, from losses of money or caste, etc. These were the alleged, or appeared to have been the only, causes that had left perceptible traces in the minds of these patients.

	Males.	Females.
Losses by Trade,	5	0
... by Lawsuits,	9	1
... of Money,	1	2
... of Caste,	0	3
	15	6

In eight cases, domestic grief appears to have produced insanity.

	Males.	Females.
Loss of Wife,	2	0
... of Children,	0	4
... of Brother,	0	1
... of Parents,	0	1
	2	6

The connections and members of a Hindu family are less intimate than in more civilised countries, hence bereavement of children or relations is little apt to induce insanity, except among the more susceptible of the female natives. In six of the females in the asylum, these losses appeared to have been followed by such a degree of grief as to lead to insanity.

In no cases did religion or religious feeling seem to have operated as a cause, or to have subsequently appeared as an effect of insanity, although there were a considerable proportion of religious mendicants, both Hindus and Mussulmans; but their insanity appeared to be produced by dissipated habits, and the pernicious use of intoxicating deleterious drugs. Some of the Hindu mendicants talked of marrying great ladies, and the Mohammedans continued regular and frequent in their prayers; but it seemed in these cases rather the effect of habit than an indication of the mind being impressed with any feeling of devotion, for they frequently went through the forms, while they committed great errors in the substance of their religious ceremonies.

Spirituous Liquors.—In Europe the excessive use of spirituous liquors is one of the most common exciting causes of madness—from 25 to 30 per cent. are produced by this cause. Over India the priesthood have employed their powerful influence in preventing the general and excessive use of spirits, and with such success,

that only one drunken patient was found in the asylum, and in that case insanity was produced by the mixture of narcotic substances with stimulants, which renders the effect still more powerful. The votary loses his appetite for wholesome food, he becomes weak, and more subject to attacks of the numerous and fatal endemic and epidemic diseases of the country. It is a melancholy fact, that late changes in the excise (Abkaree department) will render the selling of spirits much easier, and increase the consumption; and from the more respectable class of natives employed in the department, will render the use of spirits less disgraceful. The first and greatest curse entailed upon a savage when brought into contact with a more civilised people, will now, in all probability, spread over Hindustan, and produce all its pernicious consequences.

Opium.—Opium is very generally employed by the Mussulmans from its supposed property of lengthening life, and removing certain diseases, such as disorders connected with looseness, as diarrhœa, dysentery, cholera, and other discharges, as fluor albus, diabetes, watering of the eyes, coughs, etc. I have known an infant a few months old so habituated to the soothing influence of opium, that it required a supply every night to keep it quiet. It was given in this case to save trouble, and to strengthen, as it was supposed, the child, and prevent it suffering from the bad effects of cold, whereas it must have had quite an opposite effect. Such a habit in the adult produces great debility and emaciation, curtailing the enjoyments, and shortening the duration of the life of the individual. The effect of opium, when taken in large quantities, is succeeded by that painful longing, and most distressing irritability and weakness, which often destroy its votaries, by rendering them subject to other diseases, and sometimes unhinge the mind. I have seen a person, from the want of the usual quantity of opium, in the greatest distress, almost amounting to delirium, in fact with all the appearance of real madness. In four patients in the asylum the inordinate use of opium, mixed with other deleterious narcotics, appeared to have produced insanity.

Farmer, or Tolookdar,	1
Boatman, or Dandee,	1
Messenger, or Cheprawy,	1
Fukeer,	1
	4

Gunjah.—The use of the preparations of Indian hemp or gunjah[1] (Cannabis Sativa), has a much more pernicious influence on the mental faculties than opium or spirits, which are more transitory in their effect. Gunjah was well known, and its effects under-

[1] Which is the herb dried after flowering, and is usually sold in bundles, with the leaves crushed.

stood for many ages, in the South of Africa, in America, and in the greater part of Asia. It appears to have been employed in the temples of the ancient Greeks, for its intoxicating quality, and it is still employed for the same purpose by the Brahminical priests of India, and by the dissipated and depraved, more particularly of the lower class. With them it is supposed to be the ready agent to enable the person to bear hard and continuous labour without fatigue, to prevent the pain accompanying physical injury, to guard against insalubrious climates and unhealthy seasons. It likewise produces pleasing and cheerful intoxication, and has other qualities which lead to its deleterious use—as it kindles the imagination, inflames the sensual passions, and the appetite for food. Some who use it state that it renders them more fervid in their devotions, circulates the blood, and clears the voices of singers. But it is also well known that a constant, or large consumption of it, makes the person unfit for business, and, if continued, produces insanity.

When gunjah is employed as a luxury, it is used in combination with prepared, or dry tobacco leaf; each pipe-full (chillim) being filled up with from two to eight annas' weight of the compound. Sometimes from twenty to thirty chillims are used daily. The cost is about one rupee and eight annas, the two pounds (Seer). Such is the quantity consumed, that three or four rupees a month are often spent by one individual on this deleterious drug; and such is the fascination, that to increase the gratification the smoke is often passed into the pharynx and nostrils, and after remaining some time it is discharged.

It is customary for several of these miserable votaries to meet at one of their houses, and sit on the floor in a circle; each then takes a draught of the hookah, which has been prepared with gunjah and tobacco, and hands it to his neighbour. Intoxication soon occurs, as it is stated that four or five mouthfuls are sufficient to intoxicate persons, even accustomed to the use of the drug. In my inquiries, in the Dacca Insane Asylum, as to the cause of such persons' insanity, I found that of those who had formed the habit of using gunjah before admission into the asylum, and whose statement was confirmed in every case by relatives and friends, when that could be done, out of 286 that were in the asylum at the commencement, and were admitted during the year of report, 77, or nearly a third, had been rendered insane by the pernicious use of gunjah, to which the lower classes are so often habituated, from its agreeable intoxicating nature and cheapness. The effects, however, are after a certain dose transient, and are soon followed by great debility.

The remarkable effect of gunjah is, that it in an agreeable manner excites or modifies sensibility, and combination of ideas, but it does not itself give origin to them. The enjoyment is entirely moral, and not like the gratification of amatory passion. It, by use, weakens the animal passion, memory, the power of voluntary

control of the thoughts, or fixing the attention. By a great effort the mind can, for a moment, be restored to its original powers. The gunjah creates an increase of appetite, a moderate exhilaration of spirits, sometimes an intense sensation of happiness. In other cases there is a weight of the head, and an uncomfortable sense of restlessness and palpitation of the heart. Occasionally the person exhibits a disposition to assume the recumbent position, and to bring the limbs and trunk together. In one case the patient took a poisonous dose given by an itinerant beggar, to ensure the good will of his neighbours. It produced intoxication and great heat of the body, which induced him to proceed to the river to bathe, when this disposition was so great that both his head and arms went under water, and he would have been drowned had he not been observed. In this case the single dose produced insanity, for which he was sent to the asylum; and it was three months before I could discharge him as cured.

The religious mendicants are a great curse to India. One day I asked one of them, a notorious gunjah-eater, what was his occupation. Placing his hand on his stomach, he said, "Eating, and smoking gunjah." The dreadful cannabis! "But, what is your trade?" He added, "To contemplate the Great God." And where is your home? He pointed downwards, and answered, "In the earth." The effects of gunjah are most pernicious: A young man, twenty-five years of age, was admitted on the 1st August, and discharged from the asylum on the 22d, well. He was brought back in six days, much worse than he had been during his first attack. I found he had again indulged in gunjah, having taken five or six chillims daily. He recovered in three months; and requested to be allowed to remain in the asylum, as he could not resist the longing desire for gunjah, and dreaded the fearful consequences. This is the usual course of these unfortunate individuals. They get well, and return to the old habit, as soon as they leave the asylum, and either die, or are sent back. During the year of report, of the 77 patients, 26 were cured, and 5 died from bowel complaints. The others remained in the asylum. Several had been more than once there. It must be allowed that there are other causes which, at the same time, aggravate the effects of the gunjah, such as exposure to the sun, bad food, unhealthy climate, and the irregular and bad habits of the individuals who are the chief sufferers.

This opinion seems to be strengthened by the nature of the employment of those who are inflicted with insanity, and are now in the asylum from using gunjah. The lower class, such as labourers, and domestic servants, and the idle and debauched fukeers, are, as the following statement shows, peculiarly subject to insanity from the use of gunjah.

Labourers (Ryots),	28	
Servants,	15	
Fukeers,	17	
		—60
Brass-workers,	1	
Taylors,	3	
Money-changer,	1	
Confectioner,	1	
Washermen,	2	
		— 8
Brahmuns,	1	
Farmer, or Talookdar,	1	
		— 2
		70
Trade unknown,		7
		77

The artists seem to indulge less in the use of the drug, and in consequence suffer less from its effects. There were none of the more respectable natives in the asylum, as they indulge more rarely in the use of the drug, or may use it in a more disguised, and a less pernicious form, particularly, as they are less exposed to the other exciting causes of insanity.

Another curious fact is, that out of 233 males, 77 or 30 per cent. were insane, from the use of gunjah; whereas 8 out of 53 insane females, or 15 per cent. only, were insane from this cause. The difference may be accounted for from the use of the gunjah being considered infamous among the natives, especially among females. The 8 belonged to the lower class of females, as stated below: of these, 5 were discharged cured, during the year.

Female Beggars,	2
... Beragees,	1
... Ryots,	3
... Fukeeranee	1
... Prostitutes,	1
	8

The following are examples of patients, in whom the insanity was produced by the use of gunjah:—

Issawn Chunder Chattergea, a Brahmun, the son of a hereditary priest of a temple; is forty years of age, and is strong, and well-made. His father does the duty of the temple; and the son, after being employed by his father, in preparing images of gods for sale, some time ago left his home, became the servant of an Indigo planter, and probably there formed the pernicious habits of drinking spirits and smoking gunjah, which affected his intellect, and obliged his parents to send him to the Dacca asylum. There, in absence of his accustomed stimuli, he got well, and was sent home.

He returned to his old habit, became "excessive in his in-

dulgences of gunjah;" his intellect became again impaired, and he was sent back to the asylum. He has employed his whole time in preparing rude figures of gods, since his admission; and repeats prayers, and the names of his gods. He works, when required, in breaking bricks for the roads, wears clothes, and sings and cries alternately at times; he chatters much, and sleeps little. Some nights he employs in preparing fantastical drawings on the walls of his cell.

In consequence of my paying some attention to his work, he has got more clay, and is preparing all sorts of mythological figures,—the serpent winding round hills, the attendants of Siva, and the sacred bull. One morning I found he had prepared a head, nearly as large as life, which he placed near the wall upon the ground, and formed a body with white sweet-scented flowers. On another occasion, he insisted on my taking the head of a dead person which he had prepared without any copy. It appeared as if divided at the neck with a cutting instrument; the muscles retracted, so as to exhibit the body of the divided vertebræ, and the transverse processes prominent, with the muscles of different lengths from their retraction. The pomum adami was drawn up, and accurately formed: the skin of the face appeared shrivelled, and stretched over the emaciated jaw-bone; the forehead was retracted, the nose sharp, the nostrils distended, and the mouth half open, as if retaining the impression of the last fearful gasp. Even the eyes were open by the retraction of the muscles, and not shut as one less attentive to nature would have represented. On examining more closely, the buccinator muscles were still prominent, and the sterno-cleido-mastoid muscle was visible. The face was exactly that of a person in the last agony, as described by the father of medicine. This is not a solitary or even uncommon quality among those Hindus, whose hereditary occupation is to prepare the figures of gods, and other such works. I have known one of them sent for, by chance, who sat down to prepare a bust of an individual, which he did with an exactness and elegance that was truly remarkable, throwing a considerable degree of character into the bust, and even preparing the drapery with much grace and elegance, although the European dress added much to the difficulty of such a result. One day this patient stopped me, and commenced unfolding a small parcel he carried about him: rag after rag was untied, and he exhibited shells, plumb-stones, etc.; at last he came to the centre of the parcel, which contained a piece of printed paper, which he unfolded amidst sobs and tears. I found this to be a sheet of the New Testament in the native language, which he read to me amidst many tears. Strange that the sacred oracles should have penetrated and become a prayer to an insane Brahmun!

Fygun had her insanity produced by smoking gunjah; and two days after being discharged cured, she was re-admitted in a state

of mania from the same cause. She was very excited and unmanageable on admission,—rolling about on the floor, tearing her clothes, and abusing every one who came near her. She would not eat or work, and was obliged to be confined, from beating another patient. She began to work a month after admission, became rational in her conversation in another month, and was discharged cured five months after her second admission.

The difficulty of breaking the habit of using gunjah is always very great, and the recurrence of the insanity is generally the consequence even of a slight indulgence. Some years ago, I tried to prevent an unfortunate young man from obtaining his usual supply. He was reduced to a skeleton, took little or no food, and lived only to enjoy the fascinating drug. He was in a state of great nervous distress on the withdrawal of the gunjah, and complained bitterly of the privation; but no bad effects followed, and his health and strength improved while he remained in the hospital. In the Dacca jail it was found that the privation of the usual quantity of the drug and opium produced diarrhœa, etc., which was checked by allowing a small quantity daily.

We give below the proportion of Mussulmans compared with those of Hindus in the city of Dacca, affected with insanity from using gunjah, and the number of the insane from the city and district of Dacca, compared with those of the surrounding districts. This difference may be in part owing to the dissolute habits of a Mussulman city; and from cases of insanity being more generally forwarded to the asylum, than when they occur in other districts. But there is no doubt that the principal causes of the great number of cases of insanity produced by the use of gunjah, are the low price of the article, and the great number of licensed shops in the city, and the interference of Government, by placing a duty on gunjah, is loudly called for.

Mussulmans,	35	
Hindus,	42	
		— 77
Dacca,	61	
Furredpore,	3	
Bachargunge,	6	
Tipperah,	3	
Sylhet,	1	
Mymensing,	1	
Pubna,	2	
		— 77

Churus, or the inspissated juice of the Indian hemp plant, is usually taken mixed with water. In half-an-hour it produces intoxication of a most cheerful kind, increases the appetite for food, and for sensual enjoyments. Should the Government restrict the sale of gunjah, many would be forced to give up the pernicious habit, as churus would be too expensive to enable them to purchase it.

The churus is prepared in Bengal by beating a quantity of the Indian hemp plant, exposing it to the influence of the night dew, and pressing the bruised plant with the naked hand, to which the churus adheres: it is then scraped off for use. It is of much higher price than the gunjah, and is more rarely used, particularly as it is far less stimulating, and produces a lighter degree of intoxication. So great is the difference, that ten pipes of churus will not cause the same effect that one of gunjah will produce. Still, churus is sometimes used by the rich, and by singers, etc.

Animal Passions.—Indulgence in the animal passions appears to have been the cause of insanity in eight susceptible males, and in one female in the asylum; while love and jealousy appear to have produced the same effect in two males and two females.

Fancied Causes.—The Hindu Brahmuns declare, in their writings, that certain sins are punished in a manner proportioned to the aggravation of the offence. To strike a Brahmun, or kill a cow, was considered a crime of the deepest dye, and the punishment was of the severest description that ingenuity could invent. No doubt such notions instilled into the Hindu youth, make a profound and lasting impression on the individual; and when assailed by those mental diseases, to which their dissipated habits, and use of gunjah render them so subject, they are sometimes prompted to those very deeds that in the sane state they viewed with such horror and aversion. It is in the same way that relatives and dear friends are viewed with horror by the insane!

Sabu, æt. 40, afforded an example of such a supposed punishment. He was declared to have cut out the tongue of a cow, for which he was struck with madness. I asked him how he had done it, and instead of stating, as such patients usually do, that he was instigated by the devil, he gave in all probability a truer account, by declaring, that the cow would not give the same quantity of milk as the other cows, and to punish her he cut out her tongue. The deed of a madman, although stated by interested persons to be the cause of this disease. *Sabu* was a very large muscular person, with an agreeable expression of countenance. One day I found him standing upon the steps of the verandah, apparently addressing a crowd supposed to be standing before him. He continued mumbling quite unintelligible language, but the grace with which he threw his body into different attitudes, was most interesting. It was indeed a study for a sculptor. At one time he appeared to be entreating, at another time commanding; now he appeared to address the crowd of insane patients around him with all the powers of eloquence and graces of intellectual manhood, at another time a high tree that was near, and now the rising sun. His manly frame, his muscular limbs, were in continual motion; and although nothing was heard but a mumbling noise, all the passions were most vividly expressed in his fine countenance. In this case the amendment was slow, and the cure uncertain.

The *physical symptoms* of madness deserve consideration, as they afford some peculiarities in Bengal. In general the symptoms are those of great weakness of the system, such as succeeds an attack of an acute disease. The skin is dry, or unusually moist, with a peculiar odour. The countenance is fixed; at other times the look is unsteady and timid, and is less than usual under the influence of external emotions; the muscles are weak, cramped, and tremulous; the voice becomes changed, and the excretions are often discharged involuntarily. The degree of these symptoms varies in different individuals. The sensibility differs likewise, being sometimes increased, and at other times more or less diminished; so that in some cases the least thing exasperates the patient, and in other cases nothing makes any impression upon him. There is likewise a local affection, in which the sensibility appears concentrated on one organ, when exposure to heat and cold, or even wounds, do not elicit the least symptom of pain. For a like reason, large doses of medicine are required to produce the same effect as in health. When a favourable change takes place in the insanity, the pain of the wounds, and the action of medicine operate as in the healthy state of the body.

Many insane persons have, during excitement, an uncommon strength of body, but most fortunately it is almost entirely used to overcome any fancied, or real resistance to their wishes. In the Dacca asylum this is carefully avoided; the sick are allowed freeness of action, and such an exertion of strength is very rarely noticed. Nor do they avail themselves of such means of violence as may be within their reach. They are allowed to work with heavy pieces of iron, to pound bricks, and in no instance have they struck any one with them. In rare cases, a lunatic will give a blow with the hand to a person standing in his way, but will not strike any one, without some provocation.

In some cases insane patients will move about continually for long periods without fatigue, and others will remain immoveable for months, sometimes from some absurd fancy; such as that the earth is moving, etc. Some seem never to be satisfied with eating, and others drink a large quantity of water. In other cases, the insane neither eat nor drink for long periods; some individuals seem to have no desire for food, while others resist the desire, on account of some fancied obstacle, as the presence of certain insects, or disgusting matter, in the food. Some patients feel a disagreeable sensation in swallowing; in others, the intelligence is so much perverted that they cannot appreciate the qualities of any thing presented to them.

The *circulation* is found in different states; in one patient the pulse is quick and small, or unusually languid; in another it is much changed, accompanied with palpitations, hemorrhages, and piles, but these last are not so frequent as among an equal number

of persons in health in the city of Dacca. In particular parts there is an inequality in the circulation; sometimes there is a redness of the face, or an increased impulse of blood to the head, which feels hot, while the lower extremities are pale and cold. For a like reason, some maniacs discharge a great deal of animal heat, and this is often local, so that parts of the skin feel hot; and the maniac may be exposed to great heat or intense cold with impunity. I have never seen any bad effects from exposure, but always endeavour to keep the patient as cool as possible, and avoid the powerful heat of the sun; for in some cases, when the energies of the system are diminished, the insane can neither resist heat nor cold. In connection with such an inequality of the circulation there is often a free discharge of saliva from the mouth, which has sometimes a most disagreeable and peculiar smell. The same is the case with the perspiration.

The tongue, in the beginning of the malady, is commonly white, from a state of alvine irritation, and the breath loaded. The bowels are generally found a little constipated, from the nature of the disease, and a weak state of the rectum; in other cases their contents pass involuntarily, from a paralytic state of the sphincter ani. In some cases the discharge is frequent, and accompanied at times with vomiting.

The *urine*, like the other discharges, is liable to considerable change, being at one time in small quantities and high coloured, at another in large quantities, thin, and light; in one case without, and in another with, more or less deposit. In other cases it is hot, and frequently discharged; occasionally it is retained for long periods, from some absurd phantom of the imagination of the insane patient. In some patients the symptoms are worse in the morning after sleep, and in others after a restless night. This is, in some cases, due to the state of fatigue, and in others to the condition of the stomach of the patient.

The calm, soothing, and equalising influence of sleep, is often denied to the insane, sometimes from a desire of viewing some imaginary objects, or images around their bed; and in other cases from an inexpressible desire to move about, or to remove some imaginary object between their sense of sight and external objects. The sensibility is very different in different cases, being increased in some, and diminished in other patients. The pupils are generally found contracted; the heat and throbbing of the ears distressing, and the nose constricted. There is often a discordance found between the sense of sight and touch.

The insane often reason sensibly, but want words to express their ideas clearly; they have sometimes a strong *memory*, even more retentive than in health. This is particularly the case in recent insanity, but in other, though rare cases, memory is strong for distant objects, in some patients for facts long before forgotten. The recollection of particular words is sometimes lost. The *judg-*

ment is always much impaired. Some maniacs are most rational on general subjects, and it is only on special topics, or trains of reasoning, that they show their insanity.

Occasionally the maniac enjoys a degree of happiness which in health he appears incapable of. Some individuals are tormented with visions of disgusting objects; the sense of smell appears sometimes gratified, at other times disagreeable odours are fancied, and annoy the patient.

On *dissection*, the skull of the insane is often very thick, and more serum than usual is found in the cavities of the brain, with marks of previous inflammation, such as a thickening and opacity of the arachnoid membrane, and often preternatural hardness of certain parts of the substance of the brain, with more or less alteration of the cortical substance.

(*To be continued.*)

Article III.—*Medical Topography of the Western Coast of Africa.* By D. Ritchie, Esq., Surgeon R.N.—(*Continued from page* 414.)

In describing the Bights of Benin and Biafra, it is possible that feelings engendered by the wearisome monotony of a lengthened station there, may have thrown over the whole a gloom which may not be felt by those inhabiting the shore, who have never, from the integrity of their vital functions, experienced the prostrating influence of endemic disease. To them the moderate temperature, the gentle breezes, and the perpetual summer, may be a constant source of enjoyment. Here man never feels the chilly blasts of winter, nor the scorching breath of the arid desert, which burns up other countries. He requires few artificial aids to render life endurable; nature provides that which neither labour nor wealth can obtain beneath our northern sky. It is not necessary for him to fetter the activity of his muscular system by complicated garments, nor to escape from the sharp winds of heaven by surrounding himself with ponderous masonry and intricate defences; the atmosphere is so genial that he feels no inconvenience, either from his nakedness or his rude and imperfect hut. Notwithstanding, however, all that can be said in favour of the Bights, it was a matter of congratulation to all of us to escape from them, and to find a new scene opening to us after passing Cape Lopez. We beheld with delight, as we advanced beyond the 5th degree of south latitude, a bolder shore, picturesquely variegated with hill and valley, with verdant patches of forest and pasture spread over them. The sky above assumed a brighter aspect, the southern gale around breathed

a more refreshing influence, the sun no longer shone through an obscure atmosphere with a moon-like lustre, the stars no longer glimmered with a pale uncertain light, and our feelings, oppressed before with a sympathetic gloom, expanded beneath the vivifying power of nature arrayed in smiles. But it is to be understood that the brilliancy here spoken of is in contrast with the climate we had left, and not with that of more highly-favoured climes. Clouds were still frequent in the sky, though they more generally assumed airy and fantastic shapes, and were much less frequently diffused in the form of mist. The temperature in January, when we ran along the shore, was always below 80°,—the minimum being 74°. This is, however, the middle of the second and shortest winter, and therefore one of the coldest periods of the year, yet, probably, not equal to July, when the sun has advanced to its greatest distance from the zenith of this district, and causes to set in from the high southern latitudes those temperate breezes which have neither been saturated with the emanations from the land nor the moisture from a tepid ocean. This opinion is, however, founded only upon the analogies of the coast southward and northward, for our transient visit did not enable us to make any extended observations on this point.

When the early voyagers, inspired with the desire of possessing and inhabiting new countries, and with the sanguine hope of finding a gold region or a paradise, beheld these beautiful shores everywhere intersected by rivers, and indented with numerous bays, offering a commodious and sheltered anchorage, it appears surprising that they never formed any permanent settlement along all this extent of coast from Cape Lopez to the River Congo,—a distance of 360 miles; although they have built forts, and squandered treasure and life, in rendering habitable the most intractable localities, they have left to dispersed and barbarous tribes this inviting land, which promised an easy conquest.

No situation, from its beauty and collateral advantages, appears better adapted for the seat of an important commerce, and for disseminating the lofty impulses of civilisation, than Kabenda. It is a fine deep bay, about ten miles north of the Congo, offering a safe anchorage, and an easy landing-place on its broad white sands, upon which the waves are scarcely seen to break. Behind, on a gentle hill, under the shade of palms and lofty trees, is situate a small native town, inhabited by a submissive and docile people. A little way beyond the cultivated patches and the lofty forest which lies along their base, a low grassy ridge of hills, variegated with trees, runs in the same direction with the shore. The soil is rich, water abundant, and the climate in every respect appears more salubrious and agreeable than anywhere else along this coast. Under these circumstances, it is remarkable that none of the intrepid pioneers of our race and religion have made this the centre from which a most important and extensive influence might go forth reaching

into the very depths of Africa, along the course of that noble stream the Congo.

The current of this mighty river, broad and deep, is never arrested by the tide, and is even felt by ships 100 miles from the land. Where its waters mingle with the ocean, myriads of monads, deriving their existence from the organic materials brought from the interior of the continent and subjected to a new influence, impart to the waves a bright crimson hue, nearly resembling blood, beneath the rays of the setting sun. Its banks on each side, as far as Europeans generally ascend, are formed of low alluvial islands, covered with dense and lofty foliage. Beyond these, at a distance of two or three miles, ridges of low hills, partially cultivated and partly clothed with impenetrable forest, follow the sweep of both shores. About ten miles above what appears the true mouth of this river, where its width is contracted to two miles, and its current thereby concentrated, no bottom has been found with a sounding-line of 113 fathoms. This extraordinary depth is however limited, as soundings are found a little higher up, but still sufficient for the largest vessels until we ascend 140 miles, when a series of rapids contract and interrupt the channel for forty miles. After passing these, it again expands into a wide, placid, and majestic river, with verdant and cultivated land on each bank, and high hills in the distance. Its course beyond is still a mystery, and also the fate of its unfortunate explorers, Captain Tuckey and his companions. This circumstance will probably long deter others from endeavouring to solve it, although there is good reason to believe, that an expedition, conducted with greater attention to the preservation of health, might terminate very differently. If such success should ever be attained, it is impossible to contemplate the consequences without feeling impressed with their importance. The facility of intercourse presented by a long fluvial navigation through a fertile country, comparatively well peopled, rich probably in mineral productions, and possessing an agreeable climate, will in time introduce into the interior, civilisation and humanity, instead of degradation, rapine, and slavery, as at present. The abundance of rich minerals is inferred from the fact, that malachite is very often to be obtained at a low price, showing the facility with which it is collected. The same formation where this abounds will, no doubt, be found to possess other and more important materials to reward the enterprise of the discoverer. The establishment, moreover, of a legitimate commerce, will at once rescue this part of Africa from being the seat of that revolting traffic, the slave trade.

To prevent repetition, a detail of the diseases of this part of the coast, their character and causes, will be included with those to which they are entirely similar. All the habitable part farther to the south, alone now remains to be described, and which, from the tame and uninteresting features which pervade it, will be

dismissed very briefly. Between the Congo and St Paulo de Loando, for 180 miles, the littoral district is generally dry, barren, and covered with a scanty soil, through which the primitive rock frequently juts out. It rises from a rocky shore into low ridges, the sides of which are clothed sparingly with stunted trees and a brownish coloured vegetation. A few small rivers derive their origin from a range of mountains about twenty miles off, and which are observed from sea to be parallel with the shore. The country is said by observers to be fertile and well-peopled near the source of these rivers, but as they approach the shore the fertility is limited to the narrow valleys through which they run. They are only equal to the support of a thin population, weakened by internal divisions, and degraded by that universal curse of African society, domestic slavery.

As we advance southward, the sea-worn cliffs present appearances of stratification, and thick deposits of hardened clay, deeply coloured occasionally with iron, but possessing every variety of tint belonging to similar formations elsewhere. These deposits constitute the undulating features of this locality, and when subjected to cultivation are decidedly productive. Along the base and on the brow of one of these is situate St Paulo de Loando, the most imposing looking town on the west coast of Africa, and the government-seat of the Portuguese colony established here. From the scarcity of good water, the paralysing restrictions of an imbecile government, and the suppression also of the slave trade, by which it rose into wealth and importance, it is rapidly decaying,—a just retribution for neglected opportunities and perverted power. The adjacent country is capable of yielding abundantly every variety of tropical produce; but it has been depopulated, its resources have never been developed, and its harbour is rapidly filling up with the debris washed down from the adjacent cliffs, and with the sand carried hither by the tide. Under these circumstances, no hope exists that it will ever emerge from its present condition, until the dominion of that race has passed away whose footsteps crush into the very dust the rights and liberties of the unfortunate beings who submit to their sway.

From St Paulo de Loando to Benguela, a distance of 220 miles, the configuration of the coast possesses uniform features,—low undulating hills in the foreground, covered with a stunted vegetation, over which rises detached trees and numerous lofty candelabriform cacti. Rarely a sandy beach breaks the continuity of the sea-worn wall, which extends in a wavy line, sometimes forming bluff headlands and again shallow bays. These cliffs are composed of calcareous clay or limestone strata, disposed at various angles, and containing numerous marine fossils, of which the most abundant is a gigantic species of ammonite. A range of lofty mountains, having a bold and rugged profile, from which the clouds rarely disappear, runs in a line nearly parallel with the shore, between thirty

and forty miles inland. The waters coming from thence form numerous rivers, which descend to the sea through narrow valleys, which frequently, near their mouths, expand into small alluvial deltas. These are the places from which alone marshy exhalations can arise, for the declivity and dryness of the general face of the country obviate the possibility of such existing elsewhere. A few Portuguese are found at several unimportant points along this coast, engaged in their nefarious traffic at a distance from constituted authorities; but the country appears from the sea generally a desert, until we arrive at Benguela, the last and one of the principal Portuguese towns along this coast. It is situate at the bottom of a wide open bay, upon a sandy plain, with bare hills rising behind. A sluggish river runs through the adjacent plain, conferring lavish fertility, and at the same time feeding stagnant pools and nourishing aquatic vegetation. As the town was built upon the profits of the slave trade, and flourished in proportion to its activity, so now that the open pursuit of that traffic has been abolished, and its gains counterbalanced by its losses, the progress of decay is rapid and irretrievable. Beyond this to the southward, rain and streams of fresh water are less frequent, and the littoral district of country becomes gradually more inhospitable, until the whole shore presents the appearance of a sandy desert, incapable of supporting life in any form.

It is impossible perhaps to find throughout the world a temperature more genial to the feelings, or an atmosphere more grateful, than is experienced over the preceding 19 degrees of latitude thus hurriedly sketched. Light breezes blow almost continually from the southwest, never rising into a refreshing gale, and seldom dying away into a calm of longer duration than an hour or thereabout. Rain is neither heavy nor frequent, except in November and April; these being the central months of the double tropical year, are affected by the atmospheric vicissitudes which always follow the course of the sun. But rain is, however, more frequent in November than in April, occurring on fourteen days of the former month, and on eleven days of the latter. This difference arises from the sun drawing with it, as it returns from the northward of the equator, the saturated atmosphere of the northern coast; and again, as it returns from the tropic of Capricorn, the pure air of the high southern latitudes. From this cause showers are more frequent and heavier during October, November, and December, than April and May; and, besides, the amount of water which falls is largest on that part of the coast which is nearest to Cape Lopez, and decreases proportionally as we advance to the southward, until it ceases altogether, about the 20th degree of south latitude. Light fertilising showers, though oftener heavy dews, are observed every month in the year; but they are least frequent in January, February, and March, and in June, July, and August.

The annual extreme range by Fahrenheit's thermometer is 18°·5,

being from 65°·5 in July, the coldest month, to 84° in January, which is not, however, the hottest month, having only the mean temperature of 79°·3, while December has 80°·1, and may therefore be supposed to be exceptional. The mean monthly range is from 70° in July to 80°·1 in December. The mean daily range between eight A.M. and two P.M. is very small, being only 1°·1. This, however, is considerably greater than that observed in the Bights, and indicates, along with a comparison of the other observations, a climate approximating more nearly to the condition required by Europeans for the enjoyment of health.

By comparing the preceding hasty sketch of this part of the coast with that already given of the shore to the northward of Cape Lopez, an accurate judgment may be formed of the gradations of climatic influences in generating and modifying diseased action. A purer atmosphere and a range of temperature that stimulates into activity the vital functions, at once constitute conditions, the importance and necessity of which to the enjoyment of perfect health are sufficiently apparent. In the development of disease, we no longer behold the faint struggles of the prostrated organic forces oscillating between vital action and chemical decomposition—the animal powers at the same time yielding to an internal poison, and labouring under the weight of a deteriorated atmosphere. There life perishes by a disorganisation, the result of deficient vitality,—here by disorganisation, the result generally of excessive action. A more correct idea, however, of the endemic morbific powers will be derived, from describing successively the diseases which were observed among a crew of 140, of whom 20 were negroes, than by any general statement that can be made. I therefore subjoin the following detail of these, as they were observed throughout one year.

Fever, here as elsewhere along this coast, is by far the most important disease, both with regard to the numbers who suffer, and the consequences which result from it. According to our experience it prevails most during the hottest months *in the year*, and was not observed when the thermometer was permanently below 80°. On this account only five cases out of thirty-seven for the year occurred from July to December, and not one during the three coldest months, when the temperature did not rise above 76°, and the mean was not above 72°·9. It should also be stated, that the number thirty-seven gives a much more unfavourable idea of the climate than properly belongs to it, as five of these were cases of relapse amongst individuals who had previously suffered from fever in the Bights; and it is, moreover, probable that the predisposition to the disease was contracted there by several others. They were all conducted to a favourable termination on board, without requiring to relinquish the service, and without any apparently permanent constitutional deterioration. This result was the consequence of the vital forces continuing sufficiently active to

establish a vigorous re-action and subsequent remission so complete as to enable the quinine to exert its tonic power, and break at once the chain of morbid actions. On this account, then, a very considerable number of the cases were ephemeral, and the result on health trifling. They very seldom displayed any disposition to run a definite course, like the more severe forms previously observed.

The intrinsic power of the vital affinities resisted and overcame the transforming influence of the morbid poison, when it was relieved of internal obstructions, and stimulated to activity. We then beheld, without fear of the result (or rather with a conviction that the morbid phenomena exerted a salutary effect), fresh cases of fever arise and disappear. So disposed had the system become to febrile action, that no deviation from health occurred independent of it. The pure forms of fever were, however, observed to arise always in conjunction with the conditions previously mentioned—to which the essential cause of fever has been ascribed—and never without them. No case of fever was ever observed to result from exposure to the sun, or from prolonged exertion on those parts of the coast where the vegetation was scanty and languid, where the moisture of the atmosphere was absorbed by a thirsty soil, or where the temperature was below what appears a necessary condition to the production of the febrile poison. As these causes, then, are more rarely in conjunction over this part of the coast than over that previously described, so much less is the liability to fever from exposure to the influence of the land, and more particularly from exposure to the influences of localities where the whole are not united.

Next to fever, the most numerous class of diseases are those of the mucous membranes, comprising catarrh, cynanche tonsillaris, aphtha, and ophthalmia, numbering altogether eighteen cases. They are attributed to the comparatively low temperature, acting on systems rendered morbidly susceptible by a lengthened sojourn in a warmer and more uniform climate, and were proportionally much more frequent amongst the negro natives of the littoral district in the neighbourhood of Cape Palmas, on the Ivory Coast. These affections presented every variety, from the slightest and most temporary, to the gravest and most perplexing. They all, however, terminated favourably, under the use of tonics employed at the earliest possible period, after the first violence of the disease had been subdued by antiphlogistic treatment, and before irreparparable change of structure had ensued.

Resembling these in their relative prevalence, in their constitutional phenomena apart from the local lesion, and in their results, are grouped together sixteen cases of affections of the intestinal canal and its proximate organs. The more mild and undefined examples of these were thirteen, which were placed under the genus

dyspepsia; while the more severe and strongly-marked were comprised under their appropriate genera; hepatitis one case, dysenteria one case, and icterus one case. Although this enumeration may accurately indicate the relative prevalence of these diseases on board a ship, it will, in all probability, vary slightly on shore. There the congestions which are apt to be induced by repeated febrile attacks will render local organic disease of the viscera more frequent and unmanageable. Little doubt can exist that all these affections are liable to be excited or aggravated by the same cause which produces fever; and that the local determination is merely an accidental condition, arising from some local irritation or debility. This opinion is strengthened by the fact, that dysentery becomes vicarious for fever when a mechanical irritant is introduced into the system of those predisposed to the latter, by using water turbid with debris. This result is frequently observed to arise from the internal use of the water of the Congo, or of other rivers, before it has been allowed on board to deposit the matters floating in it. The comparative benignity of these diseases may be inferred from the fact, that all of them terminated favourably.

A more numerous but much less important class of affections than the preceding I here group together as "cutaneous," that tissue having been implicated in all of them, but without any other bond of union. It comprises nineteen cases of superficial inflammation, scorbutus, œdema (generally a symptom of the former), and ulcers. As none of these presented any remarkable features, nor seemed to be caused by endemial influences, it is unnecessary to say more, than that they all rapidly recovered under the use of appropriate remedies.

The most important group of cases, from entailing on us the loss of one man (who was sent to the hospital, and subsequently invalided), comprises one case of pneumonia, one of pleuritis, and one of phthisis. The last, after resisting for a lengthened period the employment of remedies on board, was sent away from the station, that he might enjoy the advantages to be derived from a change of climate. The subjects of pneumonia and pleuritis were negroes, in whom the disease assumed an asthenic type, the result of a deteriorated condition of the vital structures, arising partly from a restricted diet, and partly perhaps from the climate. The symptoms did not indicate the propriety of general blood-letting, and they terminated favourably without recourse being had to it.

The only remaining diseases include four cases of rheumatism and one of nephritis. The former were all mild and tractable forms of the complaint, and resulting from the ordinary cause—exposure to cold or wet. The latter was induced by long pre-existing stricture of the urethra, and yielded to the usual treatment. As no endemial influence could be traced in the causation or progress of these, it is unnecessary to dwell longer upon them, or to mention

here anything further than injuries, the effect of violence, which considerably augmented our sick list.

The preceding sketch may perhaps give too favourable an impression of the salubrity of this coast; but it is impossible to consider that as an unhealthy locality, where men can expose themselves for weeks together in an open boat, as they often do, without contracting disease. Having thus completed my design in writing this article, it is hoped that no error of consequence has anywhere been committed.—I can only say, that I have carefully endeavoured to guard against this, by detailing merely the result of personal observation and experience.

Article IV.—*Contributions to Legal Medicine; being Observations on the Medical Jurisprudence of Infanticide, with especial reference to a Case in which there was extensive Fracture of the Skull.* By J. A. Easton, M.D., Medical Officer to the Glasgow Police.

In the number of the "Monthly Journal" for last October, I submitted a few general observations on the medical jurisprudence of infanticide; and, as a reason and apology for now returning to the same subject, I may allude to its intrinsic difficulties in a medico-legal relation, and to the fact, that the crime of child murder has of late become alarmingly prevalent in all parts of the country. At every circuit which has been held of late years in Scotland, one or more cases of child-murder by itself, or of child murder coupled with the alternative charge of concealment of pregnancy, have occupied the attention of the court, many of them committed under circumstances of great atrocity, and in such a manner as to make conviction difficult, if not impossible. Whether the difficulty in obtaining convictions in such cases be attributable to any defect in the science of medical jurisprudence, or should rather be ascribed to those barriers which the law itself has raised, in its anxiety to save the innocent at the risk of absolving the guilty, are questions of great importance to society generally, and ought to receive from the medical profession in particular the most attentive consideration.

In the paper already referred to, I adverted to the legal definition of live birth, and to the circumstance, that, while in physiology, breathing and living are synonymous—in law, the breathing may have been complete, though not the act of a child sufficiently alive —legally—to undergo the process of murder. Yet there is no paradox in this after all. The law does not dispute the physiological affirmation, that a breathing child must have been a living child *at the time and at the place* where the respiration was performed; but, aware of the fact that air may enter the lungs of a child before it has been detached from its mother, and aware also

of the accidents of parturition which may occur between that act of limited breathing and the completion of the birth, it admits no proof of life, and consequently prefers no charge of taking life away, excepting in those cases where undoubted evidence is furnished of the child having maintained an independent existence. So that the question turns not upon breathing and living, but upon being *born* breathing and living. Yet this very humanity of the law constitutes the principal difficulty in obtaining convictions in many instances where child murder has undoubtedly been committed; and it is a matter for serious consideration, whether the legislature should not adopt some means by which the legal definition of live birth might be modified on the one hand, and the punishment of child murder mitigated on the other, so as, if possible, to lessen the frequency of a revolting crime, by making its detection not altogether an impossibility, and its penalty not necessarily death. For, without disparaging the humane spirit of the law, which always desires to shield the innocent, it certainly appears passing strange, that the killing an infant *newly born* is considered "an heinous crime, and severely punishable;" while the infliction of such injuries *during birth*, as will inevitably prevent a child from occupying the *murderable* status required by law, is not an offence at all! Is it no anomaly in jurisprudence, no libel on common sense, no outrage on humanity, that those who destroy life shall be visited with pains and penalties; while they who arrest its full evolution shall be allowed to set law and justice at defiance? Yet such is the fact, and "true it is and of verity," that in many instances killing is—legally—no murder! Thus, Gui-Patin, as quoted by Foderé,[1] recorded long ago the atrocities of a Parisian midwife, who, by means of fine needles thrust through the fontanelles and elsewhere, destroyed many children whose heads only had passed into this breathing world. Similar examples are narrated by Alberti, Brendel, and others. Now, in the eye of the law, these wretches, who had taken most effectual means to render subsequent separate living impossible, were guilty of no crime, because, forsooth, vitality did not exist when complete separation was effected between the mothers and their offspring, though the lacerated brains of the latter revealed but too plainly, that living existence on their part—separate or attached—had ceased to be possible! The fact is, that up till the moment that the child is completely detached from the mother, it is a legal nonentity. No doubt, the fœtus in utero is stated, in legal phraseology to be *pars viscerum matris*,[2] but what part, or of what viscus, we are not informed. Now, it were easy to show, that this dictum of the law, while questionable in anatomy, is valueless in jurisprudence. Thus, let us suppose that the dictum

[1] Médecine Légale, tome quatrième, p. 493.
[2] Hume's Commentaries on the Law of Scotland respecting Crimes, vol. i. p. 181.

referred to is steadily kept in view, as a guiding fact in law, during the investigation of a case where an infant has been born dead, in consequence of fatal violence having been inflicted before it was completely extruded from the mother—at that period, be it observed, when it it is held to be pars viscerum matris—on whose person, let me ask, on that of mother or of child, would the prosecutor and the medical examiner expect to find proofs of the violence which occasioned the death? Where is the *corpus delicti* to be looked for here? Certainly, one would suppose, on the person of her, a part of whose viscera has been feloniously and fatally injured. And if the medical man conducting the investigation were told this piece of legal anatomy, which he certainly never could have learned in *his* anatomical theatre, would he not naturally commence the examination by minutely observing the condition of her on a part of whose viscera a mortal injury was said to have been inflicted? Well, much to his surprise and delight, he finds, probably for the first time in his experience, that the inspection does not resolve itself into a *post-mortem* examination, so usual in ordinary cases of murder; and that, for the very cogent reason, that the party under examination exhibits all the phenomena usually ascribed to life; nay, more, that so far as he can judge—for happily he is not furnished with the ocular proof—all the viscera in the chest, belly, and head are sound, while not a trace of violence is observed on any part of the body; consequently, on the mother, no *corpus delicti* can be established. Does the medical official now proceed to the examination of the only remaining "viscus" not yet examined, and which presents itself in the shape of a full grown dead child? This surely is needless labour. The lungs—for strange to say this part of the viscera has lungs—show, no doubt, that the child had breathed; a riband, it may be, tied tightly round the neck,[1] or perhaps a portion of the gullet and of the windpipe having been cut out with a penknife,[2] shows that it had been killed; but then, as the medical man is unable to swear that the said child sustained this violence after having been completely separated from its mother's womb, not only no murder has been committed, but no offence whatever that is cognisable by an earthly judge! Fœticide, such a crime may be, or rather is; but then the law recognises no such *nomen juris* as fœticide;—infanticide it cannot be, for the necessary legal proof of independent existence cannot be afforded. And why should not fœticide be a *nomen juris*, and be dealt with accordingly? If a female be delivered of a child clandestinely, and if on that child there be discovered marks of violence sufficient to cause death, while the general aspect of the body otherwise, and the healthy condition of the vital organs, make it apparent that but for the violence found on its person, the child would have lived, should not *some* charge—not child murder—be preferred against

[1] Taylor's Medical Jurisprudence, p. 502. [2] Op. cit. p. 507.

such a female, and if substantiated, should not *some* punishment—not death—be inflicted? But it may be urged against this procedure, that in such circumstances no proof could be led that the injuries observed were not the result of accident. To this objection it may be replied, that much, if not all, would depend upon the nature of the injury. If it were a severe bruise on the scalp, for example, such as might be produced by the child falling, in the act of being born, on a hard floor or pavement, then, most assuredly, let no proceedings be instituted, and let the suspected person get the benefit of the doubt. If, on the other hand, in a case also of secret delivery, there be found such violence on the child, as a firm ligature around the neck, or a portion of the throat cut away, or a severe and extensive fracture of the skull, or any other injury which could not have resulted from any species of accident, but must have been caused by deliberately felonious intention, then surely, in any such event, she who gave birth to the child should be compelled to show how these injuries were sustained, and how the child was placed in that disabled condition, that it was impossible it could have been born alive. Are skulls to be battered with wooden clogs,[1] brains to be rummaged with long needles, throats cut out, and windpipes compressed with impunity? It is absolute trifling to assert that crimes of this description, in which ruthless violence is resorted to, such as none but a fiend could plan, and none but a demon execute, are met, either in regard to essence or to punishment, by the statutory charge of concealment of pregnancy. This merciful modification of the law is undoubtedly applicable to many instances where the child has died from want of necessary help during the parturient act; but he would be a bold jurist who would affirm that it is applicable to the majority of the cases which are disposed of in our criminal courts, or that the punishment which follows conviction on such a charge, is at all adequate to the barbarities too often committed. On this subject Professor Alfred Taylor makes some remarks, and offers some suggestions, which appear to me so judicious, that I make no apology for transcribing them nearly at full length. "According to the present state of our law, the jury have no alternative but to convict the accused of a capital offence, or acquit her of the charge of murder, and find her guilty of the concealment of birth, the extreme punishment for which is two years' imprisonment. This is substantially the punishment at present admitted for the crime of infanticide in this country. Whatever doubt may exist, according to the forms and principles of law, there can be no doubt—medically—that living children are often criminally destroyed; and that the law, from the severity of the punishment attached in all cases to the crime, cannot reach the perpetrators. In most of these cases the punishment of death would be as much too severe, as the punishment of two years'

[1] Orfila—Traité de Médecine Légale, tome deuxieme, p. 232.

imprisonment for 'concealed birth' is too slight; and with a full contemplation of this difficulty, the civil code of France (Art. 319) wisely permits the court, on proof of extenuating circumstances, to mitigate the punishment. Some such provision is required in our law; and the unnecessary perplexities which are now thrown on medical evidence, as well as the conflicting opinions on what is live birth and what is not, would then disappear. A change of this kind might undoubtedly be made, without prejudice to the accused, or interference with the course of justice."[1] But I shall not pursue this discussion any further, and shall now submit the particulars of a case, which, while it illustrates to some extent the observations already made, bears upon other matters of great importance in the medical jurisprudence of infanticide.

On Saturday, the 27th of last March—the reader will see by and by the necessity for thus minutely specifying the date—under warrant of the Sheriff of Lanarkshire, I examined a newly-born female child, which had been found the day before among the ruins of an old house, in the village of Tollcross, about three miles to the east of Glasgow. In the examination, I was assisted by Mr Robert Steven, surgeon in Tollcross. The placenta and cord were still adhering, and the latter was coiled once and firmly round the neck. From the length, weight, and general appearance, it was obvious that the child had undergone the full period of utero-gestation. There was not the slightest decomposition. The chest was well arched, and emitted a clear sound when struck; the lungs contained a considerable amount of blood, were fully expanded, and when compressed at different points between the finger and thumb, crepitation was distinctly audible. Both in the entire condition, and when cut into many portions, each lung floated considerably above the surface of water. The divided portions were thereafter subjected to strong pressure, with the view of expelling, if possible, the contained air, but such manipulation proved ineffectual for the object proposed, as each fragment still continued to float. These phenomena clearly indicated, of course, that the child had fully and freely breathed, but *where*, we did not know, and consequently could not tell. The contents of the chest and belly were healthy. On dissecting the scalp from the skull, we found the under surface of the former, throughout the whole extent of the right side, deeply ecchymosed, and having a considerable amount of coagulated blood lying between it and the cranium. *In the centre of the right parietal bone there was a fracture extending right across the vertex for fully four inches, and embracing, of course, a part of the parietal bone of the opposite side.* This fracture was a continuous even line, not radiated, and not depressed. The pericranium, bones, and soft parts in the track of the fracture were deeply ecchymosed, while on the surface of the brain, particularly over the right hemisphere, there

[1] Taylor's Medical Jurisprudence, p. 508.

was a copious extravasation of clotted blood. The appearances, results, and lesions just described were all specified, in nearly the same language, in an official medical report, of which the following is the concluding sentence :—" The dark and deep ecchymoses on the scalp, pericranium, and bone, with the existence of coagulated blood on the brain, being changes essentially vital, incapable of being simulated by inanimate matter, we have no hesitation in certifying that this child was alive when its head was injured, and that it died from compression of the brain, resulting from extravasation of blood and fracture of the skull."

In her declaration, the accused admitted that on the Tuesday before (23d) she had been delivered of the child we inspected, but that it was still-born, and that after keeping it in bed beside herself for two days, she then (on the Thursday) threw it over a wall among the ruins, where it was found the day after. It is proper to mention, that the place where the body was discovered is not above five yards from the house where the woman lived, and in which it was evident that she had recently been delivered. She also stated, that if there were any injuries on the child, these must have been sustained in consequence of the dead body—dead, be it remarked, for two days, according to *her*—having been thrown down upon hard stones. Now I think it no breach of charity to affirm, that these statements were a tissue of falsehoods from beginning to end. In the first place, the child was not still-born, as she averred; at all events, it had breathed somewhere, and so perfectly, as fully to expand the lungs. Again, the extensive and deep ecchymoses on various structures of the head, and the extravasation of coagulated blood on the brain, demonstrated vitality; for though similar results *might* be produced by throwing a child *just* dead over a wall among hard stones, neither ecchymoses nor coagulation, such as existed in this instance, could be produced by the application of violence after the lapse of even an hour, much less of two days, after the death. And this, it will be observed, is giving the accused the benefit of the favourable assumption, nullified, however, by the state of the lungs, that the child had died in utero very shortly before being born. But what although there existed the very strongest moral presumption that child murder had been committed in this case, how, let me ask, could such a charge have been substantiated, when it was impossible to have proved that the injuries which caused the death had been inflicted after the complete separation of the child from the body of the mother? Accordingly, though, at the spring circuit held in Glasgow at the end of last April, the prisoner was indicted for child-murder, alternatively with concealment of pregnancy, yet a plea of guilty of the latter was accepted, and she was sentenced to imprisonment for nine months.

But the impossibility of proving separate existence by medical evidence is not the only difficulty which meets us in the consideration of such a case as the foregoing; and it is now necessary to

inquire whether the ecchymoses on the scalp, etc., the extravasated blood on the brain, and even the fracture of the skull could not have occurred without the application of felonious violence at all. The necessity for such an inquiry will appear from the circumstance, that it is now an accepted fact in medical jurisprudence, that fractures of the skull may be produced during birth by the force of the uterine contractions alone. Thus Dr Schwörer, of Freiburg, as stated by Taylor,[1] has collected several cases of that description; Dr West has quoted from Dr Götz one similar case in the Medical Gazette;[2] while my friend Dr Wharrie, of Hamilton, has recorded in this Journal[3] one instance also in which he "suspects" that "the immediate cause of death" was a fissure in the left parietal bone, fully half an inch in length, and produced "simply by the violent expulsive efforts of the uterus." Now, without of course calling in question the statements of these respectable persons, I think it will readily be conceded, that the occurrence of such an accident is extremely rare, so very rare, I may be allowed to add, that it has never been met with among more than 50,000 cases of midwifery which have occurred in the practice of several professional friends in this city, from whom I solicited particular information in regard to this very point. Indeed, I have not met any medical man in Glasgow, including professors of midwifery, superintendents of lying-in hospitals, etc., who has ever witnessed the accident in question; and therefore, while giving full effect to the axiom, that negative evidence can never invalidate that which is positive, I think that in a case where there are strong reasons for suspecting child murder, the existence of such a lesion, so very rarely the result of natural causes, is to be looked upon as at least a very singular coincidence. But if even this be considered uncharitable, it will scarcely be denied, I presume, that proof ought to be adduced, that there were circumstances connected with the parturient act which rendered such an accident a probable occurrence. Now, in all the cases in which spontaneous fracture has been met with, the labour had been violent and protracted, and with one exception,[4] so far as I have read, the children were still-born; in some instances there was malformation of the maternal pelvis; and, it may be added, that in all the cases the fractures were comparatively slight. If, therefore, fracture of the skull be found in a case where child murder is strongly suspected, it is, I submit, the duty of the medical jurist to anticipate the theory that such an injury had been the result of natural causes, by ascertaining whether there exist deformity of the pelvis or any other conditions likely to make such an accident probable. And it cannot be urged against such a course, that, by adopting it, we needlessly annoy an exhausted, and it may be inno-

[1] Op. cit., p. 488. [2] Med. Gaz., xxxix., p. 288. [3] Vol. for 1845, p. 848.
[4] British and Foreign Medico-Chirurgical Review, No. XVIII., p. 558.

cent, female; for, in all cases of child murder, the first duty of the medical man is to ascertain that there has been a recent delivery at all. This is the very foundation of the charge; and in satisfying himself on that point, he necessarily examines the condition of the uterus, and of course can then ascertain also the conformation of the pelvis, and the condition of the parts generally. It is a question also—not, however, to be decided by medical men—whether, in such a contingency as that under consideration, the magistrate, who takes the judicial declaration of the accused, should not inquire whether the labour had been difficult or easy, long or short. At all events, in drawing up the official report, the medical man should, in my opinion, give only a qualified statement, and should certify, that having ascertained that there is no malformation, etc., of the pelvis, and assuming that the labour has been of the ordinary kind, he believes that the fracture—which, we may suppose, is severe and extensive—has been produced by unnatural violence.

In the case which has suggested these comments, it consists with my knowledge that the labour was easy, and of less than two hours' duration; and, after what has just been stated, I think it unnecessary to do more than recal the attention of the reader to the situation and length of the fracture, and to the other circumstances connected with it already described, and which are so very different, in all respects, from those in which the skull has been fractured by uterine effort alone.

ARTICLE V.—*Extracts from Clinical Lectures.* By JAMES SYME, Esq., Professor of Clinical Surgery.

3d May.—Excision of the Superior Maxillary Bone.

I PLACE this patient before you, in the first place, to show how little deformity may result from removal of the whole upper jaw-bone. When the extent to which it enters in forming the mouth, the nose, and the orbit, is taken into account, a very serious effect of this kind might be expected. But you see that, although little more than two weeks have elapsed since the operation was performed, the countenance is hardly at all disfigured, and the articulation is distinctly intelligible. In the second place, I wish you to remark that the process of removal was accomplished by means of one simple incision through the cheek, from the malar projection to the angle of the mouth. Since I performed this operation in 1829, for the first time in Great Britain, and placed the first case of its execution on the records of surgery, various modes of incision, more or less complicated, and even zig-zagging in four or five different directions, have been proposed. But as access to the parts concerned could not be required in any case more freely than in the one you have witnessed, and as the simple incision has proved

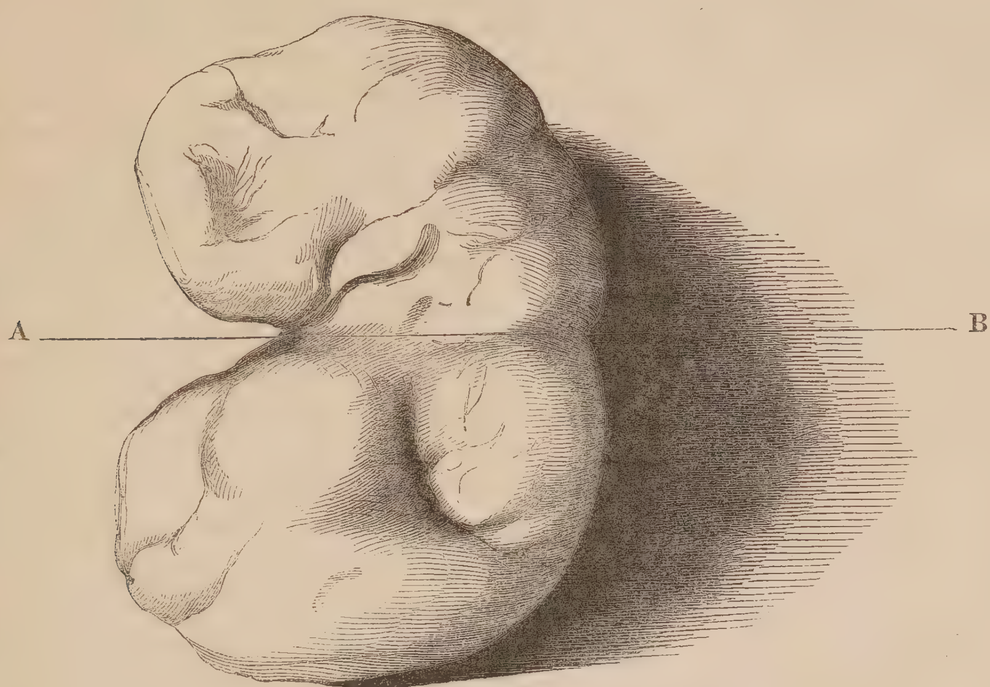
amply sufficient for the purpose, I trust you will not hesitate to discard any prejudice that may have been acquired in favour of such needless and hurtful complications; for the more simply the integuments are divided, the more perfectly may they be re-united. And in the third place, I now beg to call your attention to the perfect adhesion which has been established in the case before you. The wound has healed literally without a drop of matter, and was apparently as sound three days after its infliction as at present. From its situation, if any perceptible trace were left, it would be covered in a male by the whisker, and in a female by the string of her cap. But even at this early stage it would require close inspection to detect the line of incision. Now this perfection of re-union has an important bearing on the principles of practice concerned in the treatment of wounds desired to heal by the first intention. For if the condition which afforded such a favourable result could be ensured upon other occasions, there would be no risk of the disappointments that so frequently occur; and although this unfortunately cannot be accomplished to the full extent, the knowledge of what is really required may lead a far way to success. It has long been a well known fact in surgery, that penetrating wounds of the cheek adhere more readily than most other solutions of continuity to which the body is exposed; and various attempts have been made to account for this, on the ground of alleged peculiarities in the texture concerned, notwithstanding the obvious objection to such a view of the matter, that wounds of the cheek which *do not penetrate its whole thickness*, are no less difficult to heal by the first intention than those that occur elsewhere. The true explanation is, that a wound which penetrates into the mouth has two orifices—one external and the other internal; so that, while one is accurately closed, the other may remain open, for the discharge of blood that would otherwise accumulate in the cavity between the surfaces of the wound, so as to separate them and prevent their union. The grand essential for primary adhesion is, that the respective surfaces should be in accurate contact; and unless they are not only so situated, in the first instance, but also protected from subsequent separation through the retention of blood or other influences, their union is impossible, however conducive to this result the circumstances may be in other respects. In every wound, then, that you wish to unite by the first intention, you should employ every precaution to prevent the raw surfaces from being displaced, in regard to their respective positions; in the first place, by fitting them accurately to each other; hence the advantage of simple incisions; and, secondly, by so dressing them as to prevent the accumulation of blood. Having long laboured to establish this principle of treatment, I regret to see that a backward tendency has been in recent times manifested by the preposterous proposal of sealing up the wounds by collodion or other impermeable coverings.

Parotid Tumours.

James Jackson, aged 45, from Glammis. In the situation of this man's left parotid you see a tumour, which he says has existed since his earliest recollection, and which, in by-gone days, when pathological distinctions were less accurately drawn than at present, would doubtless have been regarded as an enlargement of the gland itself. It is equal in size to the half of a small orange, convex in form, with slight nodulation of the surface, and very firm in its consistence. Its root seems to be deeply seated, but not inseparably attached to the neighbouring parts. The growth has been so slow in its progress, as to appear stationary, until within the last few months, during which it has rapidly increased. This tumour is obviously of the fibrous or fibro-cartilaginous kind, such as is frequently met with in the mammary as well as the parotid region. It has originally no malignant disposition, but sooner or later tends to degenerate; and if it either inflames or softens, does not admit of removal with any permanent benefit. When formerly supposed to be morbid alterations of the parotid gland, such tumours afforded a fruitful source of discussion, in regard to the practicability of their extirpation. The late Dr Barclay, in his anatomical course, used to devote a lecture to the consideration of this question, maintaining that the operation could not be accomplished without division of the *portio dura* of the seventh nerve, and the termination of the external carotid artery; while the irregular form of the gland, niched as it were into so many chinks and hollows, rendered the removal of its whole substance impossible. When such doctrines were in force, "Extirpation of the Parotid" was held to be a great feat in surgery; but since the true nature of the tumour so regarded has been established, it is seldom that any claim is advanced to the accomplishment of this achievement, except on the western shores of the Atlantic, where it is still occasionally the subject of a flourish of trumpets. In removing tumours from the parotid region, it is essentially necessary to obtain free access by an ample division of the integuments. The coverings should then be completely divided, so as to expose the surface of the growth. After this has been done, in regard to the whole superficial or external part of the tumour, the dissection should be carried on by turning its base from before backwards,—that is, from the ramus of the jaw towards the mastoid process; and by cutting *upon* the tumour, so as to divide its connections, without endangering the blood-vessels and nerves not implicated in its substance.

[The tumour was removed in the way described. By means of a free crucial incision of the integuments, the convex external surface having been exposed and detached from the ear, a sort of neck was found thickly embraced by the displaced and compressed parotid gland, beyond which the growth extended to nearly the same bulk that it had done externally, so that it presented the form

here represented, the part above A B being all that presented itself to external examination. The *portio dura* and large arterial branches



escaped without injury. After the vessels that required ligatures were tied, no attempt was made to close the orifice of the wound, which would have prevented the further oozing of blood from having any outlet for its escape, and a large sponge was simply applied, with the support of a single turn of a roller. Adhesion took place without any trouble or difficulty; and as the tumour, when divided, displayed a surface of the firm fibro-cartilaginous kind, the patient left the hospital, with every prospect of future comfort, on the 19th of May.]

Maxillary Abscess.

A. B., aged 16. You see here a swelling of the face, which extends from the mouth up along the left side of the nose to the eye. It is of firm consistence, and the integuments are tense and red, so that at first sight the suspicion of a malignant growth is suggested. The patient tells us, that three years ago, while bathing in the sea, he fell upon a rock, and knocked out two of his front teeth in the upper jaw, the root of one being left in its place. He subsequently suffered much from toothach, but did not notice any swelling, until about a month ago, soon after exposure to cold and wet. Since then the stump had been extracted, and you now see that matter is discharged from the opening it has left in the gum. When a probe is introduced here it passes into the maxillary antrum, and the case clearly appears to depend upon an abscess of this cavity, originating from irritation of the broken tooth, and aggravated by

constitutional disturbance from exposure to cold. In regard to the treatment, it might be thought that, as the matter can now escape through the alveolar opening, there is no occasion for further interference. But experience teaches us that suppurating cavities of bone, no less than those of the soft parts, require that the matter secreted from their surface should have *free* egress; and I have seen this disease of the upper jaw remain obstinate, although apertures for the discharge had taken place spontaneously through absorption in three different parts of the parietes. In order to establish the requisite drain, I now raise the lip, and thrust a bistoury between it and the gum, through the thin expanded bone, cutting horizontally, so as to make a large and dependent aperture. A piece of lint is introduced at first, to check any tendency to bleed, but so soon as this ceases, the opening will be left quite free. In the treatment of all sinuses, you should consider as *essential* a free and dependent aperture—as *useless* the employment of injections—and as *injurious* the introduction of plugs or tents. Not long ago I saw a Scottish nobleman, who, while resident in Paris, had been exposed to cold, and suffered from suppuration of the frontal sinus, of which the matter had made its way through the upper eyelid, and left a small aperture. The patient told me that he applied to a practitioner of the French capital, who had seen him once a day between three and four hundred times, without holding forth any prospect of his services ceasing to be requisite, under the pretext of washing out the cavity, and plugging its orifice, to prevent the admission of air. Certainly, without being uncharitable, we may conclude that this practitioner was rather peculiar in his principles, as to either pathology or morality.

13*th May.—Popliteal Aneurism.*

Peter Lamont, aged 29. In this case the operation was performed yesterday, with strict attention to the circumstances which I have explained as essential for safety. The artery was not exposed by scratching down to it with blunt silver or copper knives, it was not denuded more than sufficiently for allowing the ligature to pass, and it was tied, not loosely with a tape, or thick cord, or bundle of small ones, but by means of a single small firm silk thread, tightly drawn. The patient being sound asleep, under the influence of chloroform, of course suffered nothing at the time; and when he awoke, felt completely free from the pain which he had previously suffered from the disease. He is to-day in every respect perfectly well, and absolutely devoid of uneasiness in any quarter. This I mention, not because it is unusual, but because it is what I led you to expect, and believe you may rely upon as the result of this operation when carefully performed on proper principles. Much blame has been attributed to me for adhering to it in opposition to the revival of pressure for accomplishing the same object, and which would certainly be deserving of adoption if there were no other more easy and

safe mode of affording relief. But, while quite ready to admit that the femoral artery may be tied in such an improper way as to place the patient's life in the greatest possible danger; believing, from upwards of twenty cases which have occurred in my own practice, that the artery may be tied without any risk of bad consequences from the operation; and knowing that, when relieved by this mode of procedure, the patient escapes without any suffering whatever, instead of being exposed for many days and nights, or rather long weeks, to agony from the pressure of screws, with no small chance of failure on the one hand, and mortification on the other,—I must still consider it my duty to practise and inculcate the ligature as preferable to the "clamps." But this I shall do without attempting to retaliate in the way of invective and personal abuse, which seldom strengthen any cause, and indeed generally proceed from the feeling of its weakness.

Excision of the Head of the Humerus.

Janet Stoops, aged 60. We yesterday ascertained the truth in regard to this case, and did what I trust will prove sufficient for the patient's complete relief. You recollect that at our last meeting I expressed my doubts as to the precise seat and nature of the disease. It was plain, from the sinuses leading to the joint, the copious discharge, and the long duration of the symptoms,—viz., for five years—that there was some morbid derangement in the extremity of one or both of the bones composing the articulation. But whether this was an exfoliation, such as you witnessed in another case the same day, or caries; and whether this condition, if really existing, was limited to one, or extended to both bones, were questions which neither the history of the case nor the most careful exploration of the sinuses seemed sufficient to determine. With exception of the lower jaw, the humerus is more prone to exfoliation of its articulating extremity than any other bone in the body, the softer cancellated portion being usually absorbed, and merely the dense part left, so that a very scanty representative of the original bulk remains. Some of you may recollect a case of this kind that occurred last winter, in which the exfoliation removed very much resembled in size and form an old-fashioned watch glass. Another result of inflammation affecting this bone, occasionally met with, is partial absorption of the head of the bone, with caries of the remainder, which is then hollowed out into a cavity, the external surface being sound and the internal diseased. Such was the state of matters in a woman on whom I operated twenty-six years ago. She had suffered for six years, and been dismissed as incurable from this hospital; subsequently came under the care of Mr Liston, who proposed nothing for her relief; and finally submitted to an experiment which I proposed. This was to cut into the joint, and ascertain the true state of matters, which proving to be an excavated state of the head of the humerus, was easily removed by excision of this part,

so that the patient gradually regained her strength, and lived in good health, with the nearly perfect use of her arm, for ten years afterwards. But there is still another form of disease, and unhappily more frequent than either of the others, in which the field for surgical interference is less satisfactory. This is caries of both the articulating surfaces, in which case I regret to say there is no mode of affording effectual relief, except amputation of the arm at the shoulder-joint, followed by free removal of the diseased portion of the scapula. In such circumstances, I have repeatedly performed excision of the articulation, but always with an ultimately unsatisfactory result; while in cases of the most unfavourable character, the more severe measure has no less uniformly proved successful. In the case which you witnessed yesterday, being uncertain as to the precise seat and nature of the disease, I made an incision directly downwards from the acromion, sufficient to admit my finger into the joint, and allow the extraction of any exfoliated portion of bone that might be detected; while it admitted of extension in the event of a more serious operation being found requisite. Having found and removed two exfoliations from the head of the humerus, I ascertained that the remaining portion of it was excavated into a cavity, while the glenoid surface of the scapula was quite sound, and therefore extended the incision downwards and backwards to one of the sinuses, which opened at the posterior margin of the axilla, guided a knife round the head of the bone, thrust it through the wound, by carrying the arm forwards across the duct, and sawed it off. The patient has been quite easy since, and will, I trust, make a good recovery. She went to sleep under the chloroform, fully prepared to part with her arm, and was not a little pleased to find, upon awaking, that she still retained it.

Ununited Fracture.

There are at present under our observation four cases of ununited fracture. Two of these were sent from different parts of the country, as hopeless subjects of ordinary treatment,—the long period of nearly six months having elapsed since the occurrence of their respective injuries. They were both admitted on the same day, about two months ago; and I then explained that the great source of such conditions being the want of sufficiently complete rest during the period of consolidation, I entertained a sanguine expectation of effecting reparation through the maintenance of absolute immobility of the broken bones. I stated, that ununited fracture of the humerus might be regarded as nearly, if not altogether, irremediable by any means hitherto contrived, and that this was fortunately of little consequence, as the muscles of the limb were so equally balanced as to render it useful for most purposes, notwithstanding the defect of rigidity. But in regard to the other bones liable to this derangement, and more especially those of the thigh and leg, which are most frequently the subject of it,

I was able to say that, in the course of five-and-twenty years' hospital and private practice, I had always succeeded in restoring firmness, by mere attention to the ensurance of stability in the position of the limb; and I expressed a strong impression, almost amounting to conviction, that various means of remedy, such as setons, sub-cutaneous division, ivory pegs, etc., owed any share of credit which they had acquired, to the care, conjoined with their employment, to keep the bones quiet. The plan I have pursued is founded upon there always being in such cases more or less deformity, from the yielding state of the bone no longer resisting any excess of muscular contraction that may exist on one side of the limb. There is thus established a preternatural convexity, upon which I place a cushion or folded sheet, and upon this—after being secured in its place—a splint of wood, long enough to extend, in the case of the leg, from the knee to the ankle; and in that of the thigh from the ribs to beyond the foot. Bandages are then applied above and below the cushion, so as to draw the distorted limb towards the splint, and render it not only straighter, but at the same time completely immoveable. In many cases of six, eight, or even twelve months' standing, the application of this simple principle has proved completely successful, and, as already stated, I have never found it necessary to employ any other measure. The two patients now under treatment—in one of whom the thigh, and in the other the leg, is concerned—have been much slower than usual in their progress towards recovery, but are now very nearly quite strong, and the limbs, which were much deformed, are perfectly straight. In the third case at present under our observation, the fracture is seated a little below the neck of the humerus, in a patient who suffers from palsy of the deltoid and other muscles, which has doubtless prevented reunion by not exercising the usual bracing effect upon the broken surfaces, and renders the prospect of recovery even more than usually hopeless. The fourth case has been treated from its commencement in the hospital,—the patient being a young man, J. C., aged 18, who was admitted on the 10th of January, for compound fracture of the leg. A large portion of the tibia was detached at the time of the injury, and an additional portion subsequently exfoliated. The greatest care was taken to keep the limb quiet in a good position, and every thing went on favourably, except that no firmness was regained. The wound has been healed for many weeks, but still the bone remains flexible, as if there were a fibrous substance interposed between its extremities. My explanation of this result is, that the fibula not having sustained a loss of substance commensurate with that of the tibia—or rather any loss of substance at all—has maintained the leg of its original length, and prevented the surfaces of the tibia from approximating to each other within range of the ossific action,—just as in the experiments of Sir A. Cooper on dogs

and rabbits, where a portion of only one bone of the fore-leg was removed,—it being always found that when the portion removed exceeded a small limit, the osseous extremities were united by a fibrous medium. According to this view of the case, the most likely mode of affording relief would seem to be cutting out the fibrous substance which has been formed between the ends of the tibia; and, at the same time, in order to promote their requisite approximation, removing a portion of the fibula. Such an experiment appears justifiable under the circumstances, and shall forthwith be put to trial.

Clubfoot—Varus.

This child, seven months old, has been brought from the country—or rather a distant town—on account of congenital deformity of the right foot. You see that the toes are turned inward, while the heel is drawn up, so that the little patient, if able to stand or walk, would rest upon the outer edge of the metatarsus. I now divide the *tendo-achillis* by subcutaneous incision, and the heel is at once set free; but the inversion is still obstinate, and I therefore in the same way divide the tendon of the *tibialis anticus*. Immediately upon which the foot admits of being straightened, and kept in this position by means of a simple splint. This will be allowed to remain for two days, when what remains requisite for complete recovery may be trusted to a leather boot, with firm sole and sides, laced in front. Such is the simple process by which the worst forms of clubfoot are now easily remedied; and there is no triumph of modern surgery more creditable to the advance of our art than the control thus acquired over one of the most unseemly, inconvenient, and previously unmanageable deformities to which the human body is subject. The author of a surgical work lately published in London (Mr Bishop), and which, from the opinions of the medical press, seems to be much admired in that part of the world, has endeavoured to show that the force transmitted through the *tendo-achillis* tends to cause eversion of the foot, or that form of clubfoot named *valgus*, and, after a demonstration to this effect, proceeds to say,—" Hence it is obvious that if in talipes varus the *tendo-achillis* is cut, it must increase the mischief." Now, the case which you have just witnessed will enable you to appreciate the incredible absurdity of this statement, so opposed to common sense and inconsistent with daily experience. Fortunately for you, Edinburgh does not possess any Orthopædic Institutions, or Fistula Infirmaries, or Cancer Hospitals, so that the whole field of surgical practice is placed under your observation, instead of being divided into sections, and committed to the charge of specialists, whose claims to confidence in their peculiar department seldom amount to more than their admitted obscurity in regard to the whole subject. You are thus able to judge from what you see, and will I trust never permit the

misrepresentations of sophistry to mislead you from the true path of experience.

17th May.—Wound of the Radial Artery.

J. S., aged 40, from Kinross-shire, states that, while pruning a gooseberry bush, he accidentally thrust the knife into his left fore-arm, at the lower part of its upper third. Blood gushed out, he said, as when a pig is stuck; but was partially checked by the pressure of his thumb on the wound, and afterwards more effectually restrained by a medical man, who stitched together the edges of the orifice, and applied a bandage. Still the bleeding repeatedly recurred, so as to require the further protection of a tight band applied above the elbow; and on the following day induced him, with the advice of his attendant, to come here for some more effectual relief. Having removed the bandage, I found a pulsating tumour at the seat of injury, which was laid freely open by dividing the stitches and extending the incision through the integuments. The clotted and fluid blood being sponged out, while pressure was made above the elbow, I dilated the opening through the fascia and muscles, so as to expose the injured vessel, which proved to be the radial artery—passed a double ligature under it—and tied one of the threads on either side of the aperture in its coats. The patient has suffered no inconvenience, and is not likely to do so. You thus see the advantage of adhering to the important principle of practice so powerfully advocated by Mr John Bell, which was to tie arteries that required to be tied for hemorrhage by exposing them at the seat of injury. The general rule is, that arterial hemorrhage should always, if possible, be arrested by local means directly acting on the wound. If the artery concerned be at or below the wrist, or at or below the ankle, pressure, if properly employed, will always prove sufficient; but if the vessel injured be of a larger size, a ligature on each side of its aperture is the proper measure for security. If in this case which you have seen, I had tied the brachial trunk, hemorrhage would have still been maintained through the free anastomosis of its branches in the fore-arm; and if pressure had then been applied, the impoverished limb would have readily passed into a state of mortification. Many arms, and not a few lives, have fallen victims to this error of practice.

Amputation of the Ankle-Joint.

There are at present in the hospital two cases requiring amputation at the ankle-joint. In the girl, 14 years of age, who is now before you, there is extensive disease of the tarsus, not leaving room for the performance of Chopart's operation, even if I deemed it expedient, which I have long ceased to do, from convictin of its inferiority to that at the ankle, especially in regard to the protection afforded against relapse. In one year alone, I

performed three secondary amputations at the ankle to remedy the sequelæ of Chopart's operation. This patient has been sent here to suffer whatever may be thought necessary, and I do not hesitate in deciding upon amputation at the ankle, which, while effectually removing the disease, will enable her to retain a limb hardly diminished in length or impaired in utility; and, what is of still more consequence, will expose her life to much less danger than removal of the leg would do. This difference depends upon the smaller portion of the body abstracted—upon the branches instead of the trunks of blood-vessels being divided—and upon the cancellated texture of the articulating extremity which is exposed, instead of the dense substance and medullary cavity of the bone. That the operation would prove safer than amputation below the knee, I anticipated from theoretical considerations, and am now able to establish on a large experience. If a patient's dissolution is inevitable from other causes, I do not mean to say that cutting off his foot will save his life; but the operation itself I believe to be as free from risk as the removal of a finger or a toe. The great and obvious advantages just mentioned have quickly established amputation at the ankle-joint in Scotland and most parts of the Continent; but in England and its capital the progress of the operation has been very slow; and as so many of you are connected with that country, I may mention what seems to me the probable explanation of this. If Mr Liston had lived longer, the case, I believe, would have been different, since he had adopted this mode of amputation, and shortly before his death performed it twice with complete success—the second of these operations being the last he undertook. I had an opportunity of seeing both the stumps, and can testify to their excellence. But of the surgeons at present in London, the only one who has openly espoused amputation at the ankle-joint is the professor of Surgery at King's College, who some time ago published five or six cases of its performance by him; in all of which, with one exception, so far as I recollect, there happened either death of the patient or mortification of the flap. Indeed, he at the same time expressed his conviction that sloughing was unavoidable. Now, such untoward advocacy—such damnatory evidence, professing to come from a friendly quarter, could not but prove more detrimental to the character of an operation than either silence or direct hostility; and when from the same, as well as other sources, were added representations as to the extreme difficulty of the operation, together with serious doubts as to the comfort and usefulness of the resulting stump, it is not surprising that there has been excited a prejudice which may require some time for its removal. Upon you who have an opportunity of judging from your own observation, rests the obligation of counteracting such groundless and injurious misrepresentations. You see that the operation is accomplished, without the slightest attempt at hurry, in less than a minute, and

therefore cannot be very difficult—that the flap does not slough, unless through some error in the operation or after-treatment—and that the stump is so perfect, that it may be used, even without any protection whatever, for standing, walking, or running.

Ununited Fracture of the Fore-Arm.

By a curious coincidence, you have here another opportunity of seeing the effects of ununited fracture; and having already witnessed it in the arm, leg, and thigh, now see it in the fore-arm. The patient, a man aged twenty-four, tells us that his arm was broken six weeks ago, and has been treated carelessly. There is now a distinct convexity backwards, with swelling of the limb, and nearly complete loss of power in it. Both bones appear to have been fractured about the middle of their length, and there is here a slight degree of mobility. In these circumstances, I expect you will have a favourable instance of the treatment lately recommended,—which consists in fixing a cushion over the convexity, applying over this a splint, and then drawing the ends of the bones towards it, so as gradually to render the limb straight,—and constantly maintain the broken part perfectly free from motion.

Part Second.

REVIEWS.

A Hand-Book of Organic Chemistry, being a New and greatly Enlarged Edition of the Outlines of Organic Chemistry, for the Use of Students. By William Gregory, M.D., F.R.S.E., Professor of Chemistry in the University of Edinburgh.

Text-books on the physical sciences have an infallible tendency to expand in dimensions, as they reach successive editions, till their original titles sometimes become singularly inappropriate. Professor Brande, some half a century ago, published an admirable "Manual of Chemistry," which proved so acceptable to the reading public, that, down to the present day, it continues to be welcomed by students, although it has so increased in bulk, that should a copy of the last edition be recovered from a fossil condition some millennium hereafter, it might lead to strange conclusions concerning the hand-span of those who grasped so bulky a volume as a literal manual. Dr Gregory has changed the title of his work, which was originally "Outlines," to that of "Handbook," but it is still within

the compass even of a lady's fingers. Nevertheless it is a somewhat formidable volume, and although declared on the title page to be intended "for the use of students," it is certainly not likely to attract any but those who truly deserve that name. Yet it is an admirable work, such as has not its equal in our language, nor probably in any other; and it will be read with delight by all who are qualified to enter on its study. They are not, however, a large number, nor in truth is organic chemistry a subject within the reach of beginners in the prosecution of the physical sciences. Into the full discussion of this we cannot enter; but few subjects are of more importance, in reference to that profession whose interests we have most at heart, than the consideration of the question,—How may organic chemistry best be taught to students of medicine? The accomplished author of the volume now before us has written specially, though by no means exclusively, for them, and the mode in which he has discharged his task will be best appreciated if its difficulties are first considered.

The formal provisions at present made for teaching chemistry to medical students, are a six months' course of lectures, and a three months' course of "practical chemistry," each occupying one hour a day. Analytical chemistry is not imperative; and the proportion of students of medicine who acquire the art of analysis, even in its most elementary form, is exceedingly small. A laudable desire on the part of the examining boards, not to increase the number of classes, already pressing with almost insufferable severity on the overburdened student, has prevented the exaction of analytical chemistry; and the percentage of pupils who voluntarily study it, is, we believe, expressible only by a small fraction. The majority of students attend lectures on chemistry during their first winter session; and in their third or fourth year, when they have pretty well forgotten what they learned at these lectures, they attend practical chemistry, much more with the view of being prepared for examination in the facts of chemistry as a science, than trained to some skill in it as an art. To young men thus taught, organic chemistry is an appalling and hateful chaos, nor can we wonder at it, or greatly blame them. To a first year's student, all that large and important department of organic chemistry which treats of physiological and pathological matters is uninteresting, and in truth unintelligible; for how shall one who has not studied botany, physiology, and pathology, and who is only at the threshold of anatomy, take interest in the problems of organic chemistry?

Moreover, even though the subject were more within the circle of his acquirements and intellectual sympathies, than with the majority of students it can be, there are difficulties inseparable from the science, whatever be the capacity and accomplishments of the learner. Perhaps the most important of these is, the impossibility of adequately illustrating by specimen and experiment the topics of lecture. In this respect organic chemistry may be com-

pared to comparative anatomy, in teaching which the prelector thinks himself fortunate if he can *show* his class a preserved torpedo, proteus, nautilus, or other rare animal, without dreaming of dissecting it before them. He can also immensely assist himself and his hearers by drawings, which, for beginners, are in some respects better than the realities they represent. On the other hand, the teacher of organic chemistry finds it most difficult to prepare what is needed in the way of illustration; and as to exhibiting re-actions in progress it is out of the question. We venture to say, that there is not a university in Europe that possesses the means of properly illustrating Dr Gregory's book, even by mere specimens; and the majority of these, although they represent, each one of them, days of labour, and are monuments of patience, perseverance, and skill, not to speak of pecuniary cost (without pecuniary value), yet outwardly are unattractive, and, perhaps to the majority of a large class, undistinguishable to the eye from familiar substances.

Moreover, even if they were more abundant, and could be submitted to experiment before an assemblage, they would seldom exhibit anything brilliant, or phenomenally demonstrative.

The organic chemist accordingly, after holding up to his students some invisible crystals, or a few minims of hermetically sealed liquid, which might as well be water, as a "very remarkable" compound with a hopelessly unpronounceable name, flees to that refuge for distressed lecturers—the Black Board. The wise ancients held a happy day "cretâ notandus," and our lecturers seem to be of the classic way of thinking, but we fear their hearers are not always at one with them. Drawings are very well, but it is seldom that even a retort or a crucible makes its appearance on the chemist's board. It has more than once made us shudder, at the meetings of the British Association, to witness a learned gentleman, chalk in hand, dashing in letters and figures, with the rapidity of lightning, upon a black board, dashing them out again with a rapidity as great, dashing in new ones, talking all the while, and finally sitting down with a pleased smile upon his face, whilst his brother chemists nodded applause, and the audience looked on with uneasy surprise.

In student-audiences the feeling of surprise soon gives way, and the faculty of reverence, to say the least, as speedily becomes torpid. They soon tire of a play of figures, which they cannot follow, and which, even if they could, would still be for them mere figures, and not the representatives of physical realities. In truth, it must be confessed, that to those who are deficient in the arithmetical faculty, the problems of organic chemistry present special difficulties; although, we may add, for their consolation, that the great Liebig is a poor arithmetician.

We trust the time is not far distant, when, by a matriculation examination, it will be secured that every medical student has mastered the elements of chemistry before commencing his strictly pro-

fessional occupations. It will then be possible to discuss before him, even in his first year, topics at present beyond his reach. We should, however, contemplate as also desirable the adjournment till a late period in his studies, of the discussion of the more difficult questions of physiological and pathological chemistry, which might be explained in a short summer course, such as the author of the volume before us delivered last summer in the University of Edinburgh.

Secondly, we trust that, before long, graduates will be required at their diploma examination to identify (apparatus in hand) the more important chemical substances, to the extent, for example, of one acid and one base. This is done on the Continent, and it is only necessary that the professors of those universities in this country, in which the occupants of chairs are both teachers and examiners, should make this imperative, to secure a great advance in the chemical acquirements of our students. At present their knowledge is too much gathered by the ear and the eye from lectures and books, not by tasting, touching, and handling re-agents and apparatus. Laboratory fees are now so reasonable, that they may be afforded, we believe, by almost all; and the time spent in the laboratory would be time gained in the end. We do not aim at making every medical student a good analyst, but we wish to see each so familiarised with the properties of the more important chemical substances, that he may appreciate the bearing of chemistry on the practice of his profession.

A text-book for students should either be a very full and explicit exposition of certain of the more important facts of the science it discusses; or a condensed and comprehensive summary of its whole subject-matter. Dr Gregory's "Hand-Book" is a work of the latter description.

There may be differences of opinion as to which kind of text-book is most suitable for the majority of students; but there can be none as to which is the more difficult to write, nor as to the skill which Dr Gregory has shown in executing his task.

The "Hand-Book" extends to more than 500 pages. Of these the first 50 discuss general principles, and the last 150 the chemical products and phenomena which characterise plant life and animal life. The body of the work is occupied with the detail, *seriatim*, of the innumerable compounds which rank under the comprehensive title of organic chemistry. With this part of the volume we shall not meddle in detail. The subjects most interesting to our readers which are discussed at greater length in this than in previous editions of Dr Gregory's book, are the doctrines of substitution, of chemical types, and of homologous groups; the large and important series of compounds containing ethyle and acetyle; the singular new bodies (resembling compound metals) containing these or similar substances along with zinc and antimony; the remarkable volatile bases which have come in crowds upon us recently, render-

ing the old distinctive title of ammonia, "*the* volatile alkali," utterly inappropriate; and the artificial formation of so-called organic bases, with the prospect, which their production holds out, of the medicinal alkaloids, in present use, such as morphia, quinine, strychnia, veratria, or others as potent, being prepared at will.

The most important section, however, in relation to medicine, is the concluding one, which is occupied with the discussion of the sanguigenous compounds (albumen, fibrine, caseine), a general sketch of the nutrition of plants, of the probable derivation of all vegetable products from carbonic acid, water, ammonia, and sulphuric acid, by processes of deoxidation; a sketch of the animal processes; of the formation of fat in the body in different ways; and an exposition of the mode in which the principles laid down may be applied to agriculture, dietetics, and medicine.

The whole of those topics, and many others, are illustrated by an ample series of instructive tables. Dr Gregory inherits the command over numbers, which has rendered so many of his family famous, and he has turned this to excellent account. At first sight the number of tables seems forbidding, when the pages are hastily turned over; but there is no needless parade of figures, nor is there any other way in which so great number of facts could be discussed in so small a space. The style is unfailingly clear and elegant, and a prodigious amount of matter is lucidly compressed within a limited bulk. The book is dedicated to Liebig, to whose views a preference is given; but an eclectic spirit pervades it, and the great authorities of the French Chemical School are liberally dealt with.

The only fault we find with the book will to many justly appear its greatest merit. It is too scientific. Science begins with the recognition of variety in unity, and ends with the demonstration of unity in variety. It is only those, however, who, like the author, have exhausted the variety of physical phenomena who welcome the exposition of their essential unity. To youthful students, with their unsatisfied appetite for novelty, and unappeased faculty of wonder, a work like this insists on a conclusion, for which they are unprepared by the stage of development of their intellectual faculties, and their want of familiarity with the premises which are alleged to warrant it. The book, however, admirably realises its own ideal, and vindicates the reputation of its author. We have risen from its perusal with a profound conviction, that organic chemistry is destined rapidly to add to the resources of all the economical arts, besides multiplying the triumphs of pure science.

A Treatise on the Diseases of the Chest. By JOHN A. SWETT, M.D. New York, 1852. Pp. 585.

THE author of this work is physician to the New York Hospital, and the thirty-five lectures of which the volume is composed, were

delivered by him in the course of his clinical instruction there. Originally, the lectures were published in the *New York Lancet*, and their re-appearance in their present form is due to the repeated solicitations of many of the author's medical friends. The additional experience of ten years in hospital and private practice increases their first value. In their re-publication, the author has acted wisely; without containing any very important new statements or opinions, they are unquestionably the production of a well-informed and observant physician. The volume is one which will prove of great value to the American student, and though we cannot rank the lectures as comparable to those on the same subject, contained in our most approved works on clinical medicine, yet, from their perusal or consultation, the British student and practitioner may alike derive profit. To the latter, the lectures are peculiarly valuable, from their containing some highly interesting statistical information, obtained in America, and, so far as we know, now for the first time published. On this subject we shall make our first quotations. In reply to the question, How does the intemperate use of ardent spirits influence the production of phthisis? the author states :—

"Two medical gentlemen attached to the dead-house in this city (New York), in which bodies are deposited which are found in the streets, or without friends, discovered in seventy-four post-mortem examinations of those who had died of the most confirmed and aggravated intemperance, not a single case of tuberculous lungs. A most surprising result, when you remember that this unfortunate class have probably long suffered from poverty, bad nourishment, and exposure to the weather; influences which also are regarded as predisposing to tuberculous deposit."

In treating of the mortality from consumption, Dr Swett adduces the following statistics of the American cities :—

"By the report of the inspector of the city of New York, and by similar reports which I have obtained from other cities of the Union, I find that the proportion of deaths from consumption, to the whole population of these cities, is as follows :—

Boston........1 in 236.	Baltimore.....1 in 290.
New York...1 in 267.	Charleston....1 in 426.

London in 1842, was 1 in 262.

"In comparing the mortality of croup with the general mortality, we find the following table :—

New York,	period of	3	years,	1 in 53 deaths.
Boston,	...	5	...	1 in 43 ...
Baltimore,	...	4	...	1 in 31 ...
Charleston,	...	5	...	1 in 122 ...
London,	...	1	...	1 in 103 ...

"In the city of New York, during three years—

620 cases occurred from December to June.
347 cases ... June to December.
Of these, 523 were males.
... 347 were females."

Croup, Dr Swett mentions, continues to occur in the American cities as an epidemic disease.

We turn to the author's observations on the curability of phthisis. On this subject his experience has been large, and its results most important.

"I have known a number of patients, during the last fifteen years, who have had the evidences of phthisis, and sometimes *in an advanced stage*, who finally recovered, and are now in the enjoyment of good health, not perfect health, for such patients carry with them for a long time, perhaps for life, slight traces of their original disease, too slight often to attract the attention of those who, ignorant of their previous history, do not watch them carefully. They do not generally quite regain their former vigour; they are apt to cough a little at times, and perhaps experience a little dyspnœa. But they are fully able to attend to the ordinary business of life."

With the light which post-mortem examination throws upon this subject, the author seems also familiar.

"For the last fifteen years, I have been in the habit of examining the lungs of all my patients, dying of every form of disease, independent of phthisis, for the traces of phthisis that has been cured. I have been astonished at the number of cases which have presented evidences of this favourable result. I can say that it is not uncommon to find in patients who have died of various diseases, and in which no suspicion of tuberculous disease existed at the time of death, cretaceous masses, few in number, at the summit of the lungs, and sometimes, but more rarely, cicatrices in the same situation, and commonly existing with these cretaceous masses."—P. 279.

These observations, and others in the same lecture, only confirm what is now a matter admitting of no doubt. We are surprised that, though aware of the observations made on this subject at the Salpétrière at Paris, Dr Swett is ignorant of, or at least does not refer to, the important papers of Professor Bennett, published in the "Edinburgh Medical and Surgical Journal" for 1845, and in the "Monthly Journal" for May 1850. We cannot agree with Dr Swett, that "cod-liver oil, the present popular remedy for consumption, is destined to be forgotten." We entirely dissent from his assertion, that it has no specific influence in phthisis. But from his observations, it is obvious that he has not given it a fair trial, and that he is further altogether ignorant of its *modus operandi;* in other words, he has overlooked the rational treatment of phthisis.

Dr Swett believes that all liniments and plasters are, in the treatment of consumption, objectionable, as tending to interrupt the cutaneous exhalation.

"The best application to the chest is water, cold water if re-action is easy —warm water if the patient is feeble."—P. 315.

We are not inclined to go so far as our author in his sweeping proscription of all unctuous applications. Counter-irritation, effected by means of stimulating liniments, or of blisters, is often of most unequivocal advantage in such cases; and we are fully persuaded that Dr Swett's antipathy to their employment rests upon no sound practical foundation.

The liberal use of cold water, we may remark, was one of the elements of cure which proved so beneficial in the hands of the late

Dr Stewart[1] of Erskine, and we have often had occasion to witness its soothing effects in allaying cough and in inducing sleep.

We conclude our notice of Dr Swett's work, by giving a longer extract from his pages, as affording a fair example of his style, and of the manner in which he has treated the important subject of his lectures.

"The causes of pericarditis have of late years been made the subject of much attention, and almost all observers agree that it occurs most frequently in connection with acute articular rheumatism. The proportion of cases in which it occurs in this connection varies somewhat in different statements, but no one can read what has been published on the subject, or have observed the disease in actual practice, without being struck with the general truth of the statement. So frequently, indeed, is pericarditis associated with acute articular rheumatism, that you should never allow a patient suffering from the latter disease to escape repeated and careful examinations to detect its existence. And this is more especially important, as the cardiac inflammation may be latent, and only revealed by the physical signs. The same remarks are equally true of endocarditis, which is frequently associated with pericarditis, or may exist independently of it.

"The frequency with which pericarditis occurs in acute articular rheumatism, appears to depend upon the severity of the rheumatic disease, the number of joints affected, and the degree of constitutional fever. It has also been observed to occur most frequently with the first attack of acute rheumatism, which is also usually the most severe attack. But it is by no means confined to these cases. It is met with in cases of sub-acute articular rheumatism in which the local affection of the joints is slight, and the constitutional excitement is moderate. The disease is very rarely associated with cases of rheumatism which may be called chronic, or in cases in which the acute symptoms have subsided. I have never known it occur in connection with simple muscular rheumatism.

"It has been common to explain the affection of the pericardium in acute rheumatism, by the doctrine of Metastasis. But this view of the subject will not bear a careful examination. It is true that cases are occasionally met with, in which the inflammation suddenly leaves the joints to attack the heart, but these cases are rare. Generally the heart-affection comes on after the affection of the joints, and without any mitigation of the articular inflammation. In a majority of cases this occurs early, perhaps during the first week, although it is not unusual for the heart to be attacked at a much later period. It occasionally happens that the heart is attacked first, and the joints subsequently, or the affection of the joints is so trifling as almost to escape observation, bearing no proportion to the severity of the cardiac affection. So that after a careful study of the subject, you must, I think, be brought to the conclusion, that the cardiac inflammation, as well as that of the joints, are equally the result of a common cause, which may be in the blood, or in some unknown condition of the system."—Pp. 385, 386.

[1] We are glad to learn that a memoir of the life of this excellent man and accomplished physician, with special reference to his treatment of consumption, is likely soon to be published by his son, Dr A. P. Stewart, of the Middlesex Hospital.

COLLOQUIA DE OMNIBUS REBUS.

SCENE.—*A Literary Dissecting-room, with the Mangled Remains of Authors, in various stages of Decomposition.* TIME.—*Evening.* COLLOQUII PERSONÆ.—*Medicus, Chirurgus, Obstetricus, Physiologus, Chemicus, and the Editor.*

Medicus. Do any of you know what that is?

Chirurgus. It has not a prepossessing odour.

Medicus. A pupil this morning said it reminded him of a negro ball in Jamaica.

Physiologus. I think it rather pleasant.

Medicus. So does Dr Pereira. He says the odour is "powerful and fragrant" [*Pharm. Journal*, April 1852.]

Editor. It has a most unmistakeable smack of aloes.

Medicus. And no wonder. It is the genuine *ὀπισμα εκ της αλοης,*

THE NATURAL JUICE OF ALOES, fetid, and still fluid, as when fresh exuded from the plant on the shores of Araby the Blest. A London importer had it sent him the other day from the Red Sea, *via* Bombay, for the satisfaction of the curious; and Dr Pereira has sent this sample down. You see it consists of a yellow granular magma, in a dark orange-coloured liquid? The yellow stuff is a mass of microscopic crystals of aloïn—indisputable aloïn—the principle discovered in Barbadoes aloes by Messrs Smith in Duke Street.

Chirurgus. If you are sure of that, you will relieve my mind of a great load on the score of organic chemistry. To confess the truth, I have never been quite satisfied, that nature, and not the chemist, made all that legion of vegetable proximate principles,—such, for example, as our friend Dr Anderson was telling us about the other evening at the Royal Society, in his paper on "Opium." But this undoubted *educt* gives one some faith in proximate organic analysis. Are you sure it is aloïn?

Chemicus. Quite. I looked at it this morning under the microscope. The appearance is splendid, and entirely that of Smith's principle. There can be no doubt of that.

Chirurgus. Tell us something more about it.

Medicus. Mr Smith, from whom I got the liquid, gave me also this bit of *succus spissatus*, made by him from it, which has all the characters of the finest socotorine aloes—*λιπαραν, και αλιθον, στιλβουσαν, ὑποξανθον*, or, as our own Pharmacopœia has it, "translucent, garnet-red, and almost entirely soluble in spirit of the strength of sherry." It must be active. A friend, after merely tasting it, a little too incautiously perhaps, found next morning that he might as well have taken pil. al. comp., gr. x. If we could always get such an

article,—and why not, if once?—or rather, why not aloïn from it, as it would be easily detached from the juice?—

Physiologus. But are you sure aloïn is the active, and only active, ingredient in aloes?

Obstetricus. I can speak for the activity of Smith's aloïn. I have for some time past given it often as a laxative, from finding that a grain, or even less, did all the business of the best aloetic pill,—*tuto, cito, et jucunde.* The makers say that they have sold a quarter hundred weight of it. Depend upon it this substance aloïn should be looked to.

Medicus. Surely. We are no longer in a condition to maintain, as many have done against the substitution of proximate principles for crude drugs, that nature is the best druggist, and presents medicines in the fittest state for use. My experience, though more limited, is to the same effect with yours as to aloïn. Let it be fairly tried by all means. And in the meantime it is a satisfaction that a discovery so interesting, and possibly so important in practice, as that of aloïn, should have received from this juice so remarkable a confirmation; and above all, that the discovery, in a very difficult branch of proximate analysis, which had foiled some of the ablest continental chemists, was made by a townsman of our own.—*To Chemicus.* What have you made of the birds I sent you?

Chemicus. What? Lord Selkirk's pheasants? A clear case of Culpable Phasianicide,—of wilful

POISONING OF GAME WITH ARSENIC. Their crops were crammed with *acidum arseniosum.*

Chirurgus. Where did this happen? What is the story?

Chemicus. The gamekeeper at St Mary's Isle had lately seen, notwithstanding the healthiness of the season, a great many dead pheasants in the preserves; and on some occasions he observed them in the act of dying, when they were kicking abnormally, not at all like what he had often witnessed before in death from—

Editor. Lead—

Chemicus. Or other natural causes. So, having for some time had reason to keep his eye on one or two worthy people in the village, he got his Lordship to look a little into the matter. And this is the result. A roasted pheasant with such stuffing would be no joke.

Medicus. But was there not some difficulty, in consequence of a neighbouring farmer having steeped his spring wheat in arsenic, for sowing a field hard by?

Chemicus. There was at first. On the other side of a ravine, on the hither bank of which lay the dead birds, there is such a field. I don't know, however, if arsenic was contained in the farmer's *steep*, or, consequently, in his wheat. But there was no wheat in the pheasant's crops—oats, pease, and haws, and grass roots in

abundance, but no wheat. Therefore the cause, the agent, the purpose, and the habit and repute, are all equally evident. I wish the scoundrels had dined on them, or else left out the arsenic, that honest men might have done so.

Medicus. Console yourself with this new importation — these American partridges, which combine a rare whiteness and tenderness with a high game flavour; and are even finer too in July, judging from a single trial twenty months ago. This is no small an invention in the gastronomy of convalescence. The bird is almost twice the weight of an East Lothian partridge, and comes at a time when no other game is to be had of gastronomic note,—nothing save stringy ptarmigan and tarry capercailzies from Norway, a wild goose now and then from Gullane Links, or a stray whaup, or a lean wild duck, or a miserable leveret.

Editor. But is it a partridge? Its tail, which garnishes the dish, pheasant-like, is rather the tail of a hawk.

Medicus. And the cock has a black ruff. Still it is a partridge, the Drumming partridge of the Americans; or at least a *Tetrao*, the *T. Umbellus* of naturalists.

Physiologus. Here is some one that has escaped notice among the mangled remains of authors. Who is he?

Obstetricus. DR ESDAILE ON MESMERISM AS AN ANÆSTHETIC AND CURATIVE AGENT.

He seems very wroth that his paper has been declined. He says Dr Simpson invited him to write it; but has forgotten to mention that the suggestion to do so was made casually and indirectly by Dr S. before the "Monthly Journal" came under its present management. Dr Simpson expected that Dr Esdaile would send him a valuable statistical account of the surgical operations which he had performed in the East. The paper which *was* sent seemed so similar to another communication by the same author, which had appeared in the "Medical Gazette," that it would have been absurd to republish it as an original article in another journal.

Editor. Besides, it contained little of surgical interest, and was rather a sort of apology for mesmerism.

Chirurgus. It is fortunate he has printed the paper. The contents afford ample explanation of our alleged fastidiousness.

Chemicus. All the statements having been repeatedly published before, Dr Esdaile should have tried his hand on the natives of Europe, in compliance with the offer of opportunity he alludes to. Had he succeeded as well with them, as he says he did with the rice-eating children of the East, he might then have twitted us with indifference, had we shown any.

Medicus. He had good reason for not risking that trial, though he does not choose to mention it. He could not succeed with Europeans in India, and but little, as I have heard, even with the hardy natives of the north of India.

Chirurgus. If we were ourselves to try, and were to fail, he would probably tell us, like our friends in Dublin, that "we did not know how to do the thing." I once operated on a patient who had been previously under the diligent pawing of a famous mesmeriser for six months, without any approach to insensibility being induced, and who finally submitted to the knife when chloroform was introduced.

Physiologus. But what do you say to his having removed two hundred scrotal tumours, with only ten deaths from the operation?

Editor. That mesmerism had nothing to do with his success, which was simply owing to the peculiar constitution of the natives of India, who were long ago known to bear, with comparative ease and safety, the most formidable wounds and operations, that are generally fatal to Europeans.

Chirurgus. The results are certainly very different from those formerly obtained. In Mr Liston's case, although the tumour weighed only forty-two pounds—a mere trifle to those of Dr Esdaile—it was found impossible to preserve the genitals; and so the whole affair was removed by a clean sweep of the knife, which proved all but fatal to the patient,—the awful gush of blood which attended this decided measure nearly drowning a young gentleman, who sat upon the floor supporting the parts. The poor Chinaman, who turned his back on the Celestial Empire, and crossed the wide seas to enter Guy's Hospital, sunk immediately after the operation, which the late Mr Aston Key performed for his relief. And Dr Tetley, in relating his West Indian experience, tells us of a case, in which the tumour, weighing a hundred and sixty-five pounds, required eight hours for its removal, and adds that the patient died *towards the conclusion of the operation.*

Editor. When tumours of such monstrous size are operated on, would it not be more correct to say, that the patient was removed from the tumour, than that the tumour was removed from the patient?

Chirurgus. Certainly; and Dr Tetley accordingly says, that "from the tumour" just mentioned, the operator, the late "Mr Wilkie, endeavoured to separate the unfortunate possessor."

Editor. But to revert to Dr Esdaile's mesmeric anæsthesia, as it has been confessed by equally skilled mesmerists, such as Darling, Lewis, etc., that not more than one person in every twenty can be brought under it in this country, and these chiefly hysterical women and men, my opinion is, that the Doctor has exercised a sound discretion in practically leaving his black art among his black friends, and declining to practise it here.

Physiologus. During the Edinburgh mesmeric mania of last winter, it was found that some healthy men were so impressionable, that the suggestions of the itinerant mesmerists influenced all their sensations, movements, and mental operations.

Editor. But their nervous energies had been exhausted by some monotonous manipulation or exercise—

Physiologus. Hence the facility with which they were influenced. My theory strips mesmerism of all its marvels, and reduces its phenomena to the level of perverted nervous functions, trance, somnambulism, and other conditions, with which medical men have been long familiar.

Editor. Dr Esdaile thinks he has mesmerised comatose patients. How can you apply your theory to such cases?

Physiologus. Simply by supposing that coma has been confounded with trance, or some analogous condition, in which the subject of experiment is highly impressionable. This explains the whole matter.

Medicus. Let us be content with chloroform. By the way, I am sorry to see it has at length proved fatal for the first time in St Bartholomew's Hospital. The case seems unusual. The patient, after having been brought materially round, is said to have sunk nevertheless in the end. This is a different accident surely from any which had previously occurred. I wish we had a good account of

THE CAUSES OF DEATH FROM CHLOROFORM, of which I suspect there must be more than one variety.

The awful instantaneousness of death on some occasions, its instant completion, is irreconcilable in such cases with any other mode of death than that which commences at the heart. And, if farther evidence were wanting, that death may occur sometimes from arrestment of the heart's action, you have it in the following case, the particulars of which I had from Dr James Dewar, of Torrieburn, to whom it occurred. His patient was so timorous a lady that she would not submit to the introduction of a seton without being chloroformed. The usual dose, about a drachm, was used on a handkerchief: but, before it was finished, the surgeon's attention was attracted by the deadly paleness and ghastly expression of the patient's features, whom he found to be all but pulseless. The usual incidents of protracted and extreme faintness ensued, powerful stimuli were required to prevent the flagging heart from ceasing to beat altogether, and it was only under the assiduous use of spirit of ammonia and brandy for three-quarters of an hour, that the powers of the heart were first feebly sustained, and eventually relieved from oppression. Under less watchful care, there can be little doubt that a few seconds more of chloroform inhalation would have occasioned instantaneously complete death by syncope. And, could we have an early enough inspection in fatal cases of this description, I apprehend we should have farther proof of their nature in the presence of florid arterial blood in the left cavities of the heart. Of course, in every account given of the appearance of the blood in the heart after death from chloroform, it is described as having been black in the several cavities; because, in no great number of hours, in obedience to a general law, blood, though

florid after death, becomes dark and venous. But a different state would be seen, were it possible to make the examination very soon after death. This, then, is one mode of death,—viz., by paralysis of the heart. But there must be more ways than one of dying from chloroform.

Chemicus. It has been left to London ingenuity to devise another. That fatal case at St Bartholomew's seems to have unsettled the minds of our brethren in London more than ever. They now wish to make it appear that there are certain constitutions susceptible of a poisonous effect from chloroform on the blood of the patient, who consequently must die even in the hands of Dr Snow, if he should unfortunately happen to meet with such an unlucky customer.

Obstetricus. It is curious that chloroform alone, of all remedial agents, should be held responsible for the bad effects of the unskilful employment of it. How many patients have been poisoned by mercury, antimony, opium, prussic acid, and strychnia, or even with common salt, cream of tartar, and sulphate of magnesia, through ignorance or carelessness of the administrator or the patient, without suggesting the banishment of these drugs from the materia medica, or the restriction of them to a special race of adepts. I heard lately of a case, in which a boy was sounded for stone in the bladder under chloroform, and with the handkerchief allowed to remain over his face. The doctors differed. One said there was a calculus. Anther maintained there was none. At length they were all of the same mind. But then they found that the patient was dead, and had apparently been so for some time. Was the chloroform answerable for this?

Medicus [*to Chirurgus*]. I should like to hear what you have to say on the subject. You were at first opposed to etherisation, and not at all prejudiced in favour of chloroform, but have had abundant opportunity of judging from your own observation. What do you say to the alleged danger, its source, and its treatment? You stated to me some rather important views on these matters lately.

Chirurgus. From all that has come to my knowledge, I believe the administration of chloroform to be perfectly safe under proper management; and I also believe that any medical person of ordinary intelligence may ensure this condition by attending to a few simple rules.

In the first place, the chloroform should always be respired with a large admixture of atmospheric air. This principle was long ago established by Dr Simpson; who, while the good people of London were inhaling the pure vapour of ether with clamps on their noses and India-rubber bags inclosing their mouths, made his patients breathe from a simple bottle containing ether, and having a large hole in its side for the admission of air. The greater potency of chloroform rendered any such contrivance unnecessary; and a handkerchief has been invariably employed by him for the purpose, and by medical men in this city, as well as throughout Scot-

land. This not only affords more effectual protection from undue concentration of the vapour, but is also a much more cleanly medium of administration than the *spit-boxes* used in London, which have assuredly no inviting appearance for the fastidious subjects of aristocratic practice,—unless, indeed, the dirty ones are kept for hospitals or poor patients. Dr Simpson's plan has been pursued in the Royal Infirmary here for nearly five years, many times almost daily, by all the clerks and other junior officers, in thousands of cases, without a single instance of fatal effect.

In the next place, the person who administers the chloroform should not have his attention distracted by assisting in the operation or otherwise; since there cannot be a doubt that much of the mischief we hear of has resulted from want of due regard to this precaution.

Then the patient should always be placed in the horizontal posture, since any derangement of respiration or circulation would be attended with greater risk of fatal syncope in a more erect posture.

Farther, the inhalation should be discontinued after the induction of complete insensibility, and only renewed sufficiently to maintain the effect so long as it may be required.

Lastly, the respiration, and not the pulse, should be watched for the indications of danger.

Medicus. Why not both?

Chirurgus. At all events, whenever the breathing flags, or becomes slow and less perfect, the action of the chest should be assisted by alternate compression and relaxation of the ribs. And if respiration becomes suspended notwithstanding these efforts, the tongue should be drawn forward from the posterior part of the fauces, where it is apt to prevent the free admission of air into the pharynx. I should like to know if the attention due to this point was paid in the London case.

Editor. The London doctors should take a lesson from the army, and, as detachments from each regiment were sent to Woolwich for instruction in the rifle exercise, send Dr Snow, with a few intelligent pupils from the different hospitals, to learn the easy, safe, and effectual mode of administering chloroform, as employed from first to last in the Royal Infirmary of Edinburgh.

Chirurgus. Poor Dr Snow! He tells us, no longer ago than Saturday last, that "the possible consequences of want of attention or skill are so serious, that the office of administering chloroform should no more be delegated to a dresser than the important operations of surgery, or even to a house-surgeon, where he holds the office for a limited period."—[*Med. Times*, April 3.] So that he would make the giving of chloroform a distinct occupation, and render it necessary for every patient, during a painless operation, either to go to some hospital provided with such an adept, or to employ a Dr Snow in private. Indeed, he is so carried away by

the bright idea as to let the true object of his efforts peep out in the following matchless statement:—"It is much to be regretted, in my opinion, that chloroform was introduced before the greater number of the profession had had time to become fully convinced of the great merits of the last named agent [ether], which, when properly applied, produces all the advantages of chloroform, and is at the same time as safe as a medical man could desire; for, if any agent safer than sulphuric ether should be introduced, patients and nurses would apply it, and it might degenerate into a domestic remedy and be abused."—[*Ibidem.*] In other words, chloroform is objectionable, because its administration is so simple as not to require the assistance of Dr Snow.

Obstetricus. What is that he says about nurses?

Chirurgus. That he fears "nurses would apply it, and it might degenerate into a domestic remedy."

Obstetricus. Domestic remedy! Nurses! Has he been so long asleep as not to know that it *is* a domestic remedy,—that nurses *do* apply it? There is not a nurse on my list who does not apply it.

Chirurgus. I've no doubt you could make a Dr Snow of a nurse in five minutes.

Chemicus. I wonder so little has been written hitherto about the uses of chloroform given internally. It is strange that its novelty has not led some one to puff it as a remedy for all diseases.

Medicus. I have often found it an excellent corrective of vomiting in various circumstances, and also a calmative in palpitation, whether functional or connected with organic disease of the heart.

Obstetricus. And it often allays neuralgia, when used outwardly as a liniment, and likewise the burning itchiness that attends many chronic cutaneous diseases.

Editor. Who is it that I hear has lately proposed to make use of it as an injection for the cure of tapeworm?

Medicus. I would expect it to chloroform the patient sooner than the worm. If the *Tœnia solium* be like its far-away cousin, the *Hirudo medicinalis*, it will not be easily disposed of in that way. Do you remember how, in our Medico-Chirurgical Society experiments in 1847, our leeches recovered and walked off, after they had been for half an hour and more deceased leeches to all appearance—flaccid, œdematous, and jelly-like?

Chemicus. I should scarcely be thankful for a new anthelmintic against tænia. We are well provided already, what with oil of turpentine, and pomegranate-bark, and this Abyssinian kousso.

Medicus. Once lately the kousso completely failed in my hands; and I have been rather inclined to take up

THE MALE SHIELD-FERN, though a very ancient vermifuge. It is, I think, about five-and-twenty years since Peschier of Geneva mentioned that it scarcely ever failed in his hands, when given in

the form of an ethereal extract; that he and a friend had cured several hundred cases with this preparation, and had not met with a single failure. But, unfortunately for the male shield-fern, it was not a new remedy;—it has been known since the days of Dioscorides, who tells us that a dose of four drachms of it "drives out the broad worm,"—ἕλμινθα πλατειαν εκτινασσει. And besides, it grows at every man's door. And therefore, while hundreds make use of the pomegranate-bark and of kousso, because they are foreign, and modern, and costly, no one, to my knowledge, has tried Peschier's *Oléo-résine de Fougère* in this quarter, except myself and you, Mr Editor.

Editor. It failed lately in my hands in the man I sent to you.

Medicus. Wait till I tell you what befel that case. Some four or perhaps five years ago, I gave the oleo-resin to a young woman in the Clinical Ward of the Royal Infirmary, who had been long ill, and in a few hours she discharged many feet of a strong tapeworm in one mass. She was kept subsequently fourteen days in the hospital, in good health, and passing no more joints; which previously she used to part with every two days or so.—Soon afterwards I was consulted in the case of a Glasgow gentleman, who had taken sundry remedies there without avail. A single dose of the oleo-resin brought away a mass of tænia; but the joints soon re-appeared, and he was eventually cured by repeated doses of oil of turpentine. In this case, however, the ethereal extract was prepared not under my own eye, as in the former instance, but by a druggist; and I doubt whether the precautions for obtaining a sound preparation were fully known or attended to.—Very recently a man was received into the Clinical Ward of the Infirmary, who had laboured under tænia for five years, and been repeatedly treated with various remedies without avail. He had often taken turpentine; and on one occasion he got the commercial oleo-resin of male shield-fern from you, Mr Editor,—for this is the case you referred to. After these remedies he continued to pass one or two single joints almost daily, as he had always done. I first gave him half an ounce of kousso. No perceptible effect ensued,—he passed his single joints as usual. In a week I gave him a decoction of two ounces of the pomegranate-root bark of the shops, according to the original directions of Mr Breton. Still no effect resulted. Meanwhile I was preparing the oleo-resin of fern; and in a week more I gave him twenty-four grains of it. In a few hours he discharged six feet of a strong tapeworm without any purgative, and unaccompanied by any fæces; and in some hours more he passed other eighteen inches after a purgative. Both portions were evidently very fresh. After that no joints appeared in the discharges, and he has been now eight days free of them. By a singular coincidence,—for tænia is a rare disease in Edinburgh,—another case was admitted a few days after the last. This patient had been three

years ill. He had often passed single joints, and about a month before admission nearly eighteen inches in one line. But he never discharged any mass of continuous joints after any of the numerous unknown remedies he had taken. He got twenty-two grains of the same oleo-resin as the last patient; and soon after taking a subsequent laxative he passed six feet of a more slender and softer worm than the last patient. For a few days he continued to pass some joints, which had partially undergone digestion; but these soon disappeared.

Obstetricus. Where did you get your root? What precautions were used in preparing the extract?

Medicus. It may be got in any bosky dell about Edinburgh, or in wide Scotland. The extract used in the last two cases was made from plants obtained in Pittencrieff Glen, under the ruinous cloisters of Dunfermline Abbey. The plants for the first case were gathered on classic ground,—in Ormiston-hill Glen, the rural retreat of our Cullen, where may still be seen the ruins of box-trees, holly, and arbor-vitæ, planted by his hands, the banks carpeted with saxifrage and periwinkle of his nursing, and on the old garden walls the crumbling vestiges of quaint inscriptions,—from which it might seem as if idleness and delving had been the sole occupation of his whole life.

Editor. Whereabouts is this? How might a humble pilgrim visit such a sanctuary?

Chemicus. A quarter of a mile west of the Kirknewton station on the Caledonian Railway, and within a good stone-cast from the embankment, at a farm-steading, you will easily find the lower end of the glen. It is a lovely spot. There is no fence. Nor does the property belong to his Grace of Atholl.

Medicus. Here, as in other localities, the female fern, *Athyrium Filix-fœmina*, grows often close beside the medicinal species, *Lastræa Filix-mas*.

Chirurgus. What is that? When I was a student, and attended three courses of Dr Rutherford's prelections upon botany, five-and-thirty years ago, I knew all common ferns in Scotland; but I never heard of that one. There was a Polypodium Filix-mas in those days.

Chemicus. But there is no longer. It has been extirpated. The *Aspidium Filix-mas* took its place; but that is extinct too. The *Nephrodium Filix-mas* succeeded it, and even that also is defunct. Now we have got Medicus's plant, *Lastræa Filix-mas*, but how long we shall be allowed to keep it not even Dr Balfour can say. It is lucky, however, while nomenclaturists have been committing such fearful havoc upon British botany, that the male shield-fern presents to us the very same external characters, and the identical therapeutic properties, which it did to Dioscorides two thousand years ago. Is there never to be any protection against this perpetual reform of botanical jargon?

Medicus. Not in our days. There is scarce a medical plant that has not had three or four names in my time.

I was observing, that the female fern often grows alongside the male shield-fern. But the latter is easily distinguished from every species that resembles it, by the fronds, which are attached in the withered state even at this period of the year, being simply pinnate, not compoundly so. Peschier limits the season for collecting the root to the period from May to September inclusive, when the herb is growing or fully developed. I have always found it quite active enough in March; so that it is probably serviceable at all seasons. The fresh portions only of the root-stock and frond-bases should be used. These should be cut in pieces, and dried at a temperature not much above 140° F., and best of all in a hot-air press. Peschier says the dried root loses its virtues in a twelvemonth. I have always used it newly-dried. Being triturated not very finely, and packed rather loosely in a percolator, it is to be exhausted by sulphuric ether in the way of displacement. The greater part of the ether is then distilled off, and what little is left, to prevent risk of injury from too high a heat, is best expelled by exposing the residue to a vapour-bath temperature for a few minutes, in an open basin of glass or porcelain. I have lately found in the shops an article from London, which obviously retains a good deal of ether; but this is wrong, for there is no regulating the dose with such a preparation; and there is no excuse for so slovenly a proceeding. The oleo-resin which remains should be a sluggish syrupy fluid, opaque, dark-green, smelling not unlike orris-root, and possessed of a strong bitter and slight orris-like flavour. I have given it usually in emulsion, by triturating from eighteen to twenty-four grains with yolk of egg, and adding gradually syrup of orange and water. The worm comes away in a few hours, sometimes without any other means being used, but more generally not till the operation of a brisk laxative.

Physiologus. Did you find the heads of the creatures?

Medicus. No. That is no easy matter. I have been looking for a tapeworm head all my life, but have not yet found one.

Editor. Nor I.

Obstetricus. Nor I.

Chemicus. Nor I.

Physiologus. Nor I, for that matter. Did you ever know *any* body who had found one?

Chirurgus. Yes. I knew Rudolphi.

Physiologus. But if you did not find the heads in your cases, you can scarcely say the patients were cured.

Medicus. So it is pretended, but I doubt the authority. The head of the *Tænia solium*, the only species met with here, is so small that it must be extremely difficult to find one. As we often see half-dissolved joints following in a day or two the expulsion of the chief mass of the worm, it is very plain that the head, by much

the smallest portion of the creature, must be very apt to disappear altogether; and suppose it is entire, I should like to see a successful hunt for so minute an object in the evacuations, if there be not a goodly length of joints attached. And, after all, is it proved that the head is the most likely portion of the body to reproduce tænia? It is the joints alone, at any rate, and not the head, which present oviducts. But, in short, what do we really know either of the production or reproduction of tænia?

Physiologus. If you had read a memoir which I have been lately reading, you would have known something about it. The author maintains that intestinal worms are neither more nor less than a more advanced stage of development of the *cysticerci* that infest the flesh of animals used as food. He has traced the tapeworm of the cat to the *cysticercus* of the mouse.

Medicus. But how will that account for the tapeworm forming in man, who roasts, boils, broils, or fries, all his cysticerci, before making a meal of them?

Physiologus. Nevertheless this memoir appears to me an important addition to our knowledge of

THE DEVELOPMENT OF INTESTINAL WORMS. Among the authors on this subject, Professor Siebold was, I believe, the first to state from observation, that the *Cysticercus fasciolaris*, found in the liver of the mouse, reaches its final stage of development in the intestines of the cat, and is there transformed into the *Tænia crassicollis*. This statement was confirmed by a series of observations by Dr Henry Nelson, who, in his thesis, presented to this University in 1850, carefully traced and figured the various stages through which the tapeworm of the cat passes. The reproductiveness of this animal exceeds even that of fishes; for each joint appears to contain 125,000 ova, which will give about twelve millions and a half for the entire worm. The minute ova, thus passing off in incalculable numbers with the fæces, enter the body of the mouse mixed with its food or drink, or through the intervention of its furry coat, to which they adhere, and which it is in the habit of licking. It does not precisely appear how they pass from its alimentary canal into its liver, but most probably this is through the medium of the blood. Arrived in the liver, however, they are eaten by the cat, and in its alimentary canal are converted into tapeworms, the *Tænia crassicollis*.

Medicus. It is easy enough to see how the mouse's cysticercus may become the feline tænia; but not conversely how the cat's tapeworm produces the cysticercus of the mouse. Do you think it in the slightest degree probable, that so cleanly a creature and so dainty a feeder as the mouse would eat cat's dirt, or "dip his whiskers and his tail in" such an abomination?

Physiologus. No. But the dirt may be converted into dust so impalpable as to escape the observation of the most fastidious of mice.

Medicus. A dried up ovum is not more likely to thrive than a roasted cysticercus.

Physiologus. I don't admit the analogy between objects so dissimilar in size as a cysticercus half an inch long, and the ovum of a tænia $\frac{1}{3000}$th of an inch in diameter. But at any rate we have now got a cat's tapeworm made out of a mouse's cysticercus. This result has been very lately extended to the tapeworms of other animals by Dr Kuchenmeister—[*Prag. Vierteljahrschrift*, 1852, i., 126]. He fed dogs and cats upon parts of animals which contained different kinds of cysticerci, and subsequently found tapeworms in their intestinal canal at various stages of development, according to the interval allowed to elapse after the cysticerci were devoured. Every precaution seems to have been used in these experiments, one of which may be cited. An old dog was frequently purged, for a period of six or eight weeks, with castor-oil, to ensure that no tapeworms should be present. He then ate food containing ten cysticerci; in seven days ten more; and in six days more several others, which were not counted. Nine days afterwards the dog was killed; and there were found in the intestines thirty-five tapeworms, varying from a sixth of an inch in length, and with scarcely visible joints, to well-developed worms of 160 joints, and fifteen inches long. Similar results were obtained with cats. Dr Kuchenmeister, however, could not find any tapeworms in dogs fed with the liver of the mouse; but when he fed cats with the same liver, their intestines contained the *Tœnia crassicollis*. It would appear, therefore, that each species of cysticercus requires a certain habitat, a peculiar animal, for its development. It has been rendered highly probable that the *Cysticercus fasciolaris* of the mouse is transformed into the *Tœnia crassicollis* of the cat, the *C. tenuicollis* of the squirrel and ruminant animals into the *T. serrata* so common in the dog, and the *C. pisiformis* of the hare and rabbit into the *T. crassiceps* of the fox.

As for human tapeworms, Eschricht has rendered it highly probable that the *Bothriocephalus latus*, which occurs in man in Russia and some other countries, is the further development of a species of *Ligula*, which infests the flesh of the dorse and other fishes of the Northern seas. The origin of the *Tœnia solium*, the only tapeworm met with in this country, is most probably the *Cysticercus cellulosœ*, which inhabits the flesh of various animals, and especially the pig and sheep. Dr Nelson at least points out the following reasons for this opinion. In both, the neck is attenuated. In both the body gradually increases in size downwards. In both the head is similar, the figures given of them by Bremser being identical; and in particular both heads have a double circle of hooks; and although the *Tœnia solium* is sometimes seen without hooks, Bremser has proved this to be the result of age, one row dropping off first, and then also the other.

It is not so difficult as you [*to Medicus*] suppose to account for the admission of living cysticerci into the human intestines. Passing by the remarkable fact, that tapeworm is nowhere so common in the human subject as in Abyssinia, where meat is habitually eaten in the raw state,—and also setting aside as doubtful the alleged power of the cysticerci to resist an elevated temperature, because in that case tapeworm should be as common in Britain as in Abyssinia,—we know there are many people who prefer their meat in a very underdone state, and few are on their guard against a partial error of the cook in this respect.

In regard to the importance of obtaining the tapeworm's head, when the worm is expelled by remedies, it must of course be allowed to be extremely difficult to discover in the fæces so minute an object as the head of the *Tænia solium.* But this does not affect the importance of its expulsion as a guarantee of a radical cure. Late anatomical researches rather confirm the prepossessions of physicians in favour of getting a sight of the head, if possible. Thus Van Benedin has shown, that the head is the part from which all the joints are thrown off by gemmiferous reproduction; those formed first being pushed downwards by the formation of others, and being further developed as they descend. He considers a tapeworm as a compound fluke-worm, the whole consisting of three stages or states of growth:—1st, The cystic head (scolex); 2d, The compound tapeworm (strobila); 3d, The separated joints (proglottis). And Dr Nelson has ascertained that the four suckers of the head of the worm contain each a canal, which afterwards unite to form the two lateral canals of its body; and he describes the manner of feeding and propulsion of the contents of these canals from the head to the tail. The head is therefore important on two accounts,—first, as the means by which the animal is nourished; and secondly, as the basis on which the joints are produced. Van Benedin, indeed, supposes that when the tail-joints separate, as they often do, they may themselves go on developing, and become a species of fluke or *Distoma.* But this view is far from being established.

Editor. It is to be hoped that these results will stand the test of time. It is gratifying to see the dry anatomical researches of Rudolphi, Bremser, and others, giving forth useful results at last.

Physiologus. Those foolish people in our profession who so eagerly search only for what they call practical information, may rest assured that, in the long run, the cultivation of pure science is the surest and best way of arriving at it. No one could have expected, when Galvani made the limbs of a decapitated frog caper, and when practical men got no answer to their question, *cui bono,*—that England and France would one day be united by a galvanic telegraph. Nor could it have been imagined that the apparently barren labours of Goetze, Rudolphi, and others, would lead to the important practical fact, that tapeworm is caused by feeding on measly meat and

fish out of season, or by indulging in the heathenish custom of devouring half-raw flesh.

Editor. I confess to some little scepticism as to these German theories, and should like to hear that Dr Kuchenmeister's experiments had been successfully repeated in this country. But has anybody seen the last interesting addition to the *Fauna* of the human body—the *Acarus scabiei mas?*

Physiologus. I have something to tell you about him. But let us reserve that subject until we meet again.

Part Third.

CLINICAL REPORTS, LECTURES, ETC.

CLINICAL MEDICINE.—PROFESSOR BENNETT.

REPORT OF THE CASES OF FEVER TREATED IN THE CLINICAL WARDS OF THE ROYAL INFIRMARY DURING THE WINTER SESSION 1851-2.—(*Concluded.*)

Condensed from Clinical Lectures.

Diagnosis of Continued Fevers.—On reviewing the nineteen cases of continued fever embraced in this report, with a view of determining how far we are enabled to distinguish its varieties at an early period, it will, I think, appear that this is impossible. If there be any fact connected with the disease better established than another, it is that at the onset we are unable to determine whether any given case will turn out to be a febricula or a typhus, a relapsing or a typhoid fever. If you study carefully the symptoms presented by Cases III., V., VI., and XI., you will be satisfied of this. We may, indeed, when acquainted with the prevailing type of an epidemic, often be led to guess, with more or less correctness, as to its probable cause, but exactitude is impossible. Should the fever cease on the seventh day, then it may be febricula or relapsing fever. The latter is determined by the return of the disease; but I know of no circumstance, beyond the type of the epidemic, which can lead us to predict that event. On the other hand, should the fever continue beyond the seventh day, then we have to do with typhus or the typhoid form. Notwithstanding all that has been said as to the means of distinguishing these varieties, by means of the eruption or of the abdominal symptoms, I believe that in practice it will be found to be impossible before the twenty-first day. We have seen, in the three cases of typhoid fever which have fallen under our observation, that no eruption existed in any of them. With regard to the ten cases of typhus fever also, in five there was no eruption (Cases IX., X., XIV., XV., XIX.); in three there were rose spots (Cases XI., XIII., XVII.); in one a mulberry or measly eruption (Case XVIII.); and in one petechiæ (Case XII.) Then, with regard to diarrhœa, it is only symptomatic of typhoid fever after the fourteenth day. Thus, in Case VI., it first appeared on the twenty-eighth day, and in Case VII. on the fifteenth. In Case VIII., on the other hand, it is said to have been present from the first. From all these considerations, the distinctions which have

been made out between the various forms of continued fever, are for the most part retrospective, and can only be determined in the advanced stages. It is of the utmost importance to take this into consideration, in endeavouring to estimate the value of particular kinds of treatment.

The same arguments which apply to the uncertainty of diagnosis, may be urged against the general doctrine, that these forms of fever are dependent upon separate poisons, run a distinct course, and are governed by laws as distinct as those which regulate the various kinds of eruptive fever. Without denying the existence of various kinds of continued fever, I am of opinion that this doctrine has not been established. On the contrary, I believe that internal complications, and the accidental circumstances of season, diet, constitution, and other causes of a like nature, modify fever in particular circumstances and at different times, and that to these the variations observed are in many cases attributable.

Can we cut short a Continued Fever?—There can be little doubt that it is of immense importance to cut short the disease, if possible. Without speaking too positively, I have been induced to believe in this possibility, under certain circumstances, by means of emetics. A fortnight after being appointed Physician to the Fever Hospital of this city, in 1844, I experienced lassitude, headache, and that peculiar cold feeling in the back, which generally usher in fever. I took an emetic of antimony and ipecacuanha, and on the following day was well. Three weeks afterwards, I experienced the same symptoms; but, thinking it possible that, after all, the emetic had not really been the cause of their removal, I allowed the disorder to proceed, which terminated in a prolonged relapsing fever, with three distinct relapses. I think I have observed the same thing in other cases; and now, as a rule, whenever called in at the early period of fever, I always order an emetic. This practice, so far as I have observed, never does harm, often good; and, although the point is of course impossible to demonstrate, has, I think, been successful in cutting short many cases of fever.

With regard to cutting short continued fever by quinine, as contended for by Dr Dundas, I regret to say that the trial you have seen made of it has entirely failed. In none of the seven cases (Cases VI., VII., IX., X., XI., XII. XIII.) in which it was given, notwithstanding the physiological action of the drug was well marked, did it in any way cut short the disease, or produce on its progress, so far as I could ascertain, any amelioration whatever. On the other hand, it may be argued that in one case (Case IX.), it was injurious, by increasing the cerebral complication. Dr Christison has also tried it in one case, and Dr Robertson in eight cases, also with a want of success. Thus, in sixteen cases it has been carefully and energetically tried, with uniform failure in all.

The physiological effects produced by large doses of quinine are worthy of observation. With these I became first familiar in the wards of M. Piorry, in La Pitié Hospital, Paris, during the year 1838. At that time quinine was given in enormous doses, with a view of cutting short intermittents, and diminishing the size of the spleen. In this way I frequently saw 50 grains of quinine and 100 grains of salicine given in one dose, the administration of which was followed by the same effects you have observed to follow repeated doses of 10 grains in the Royal Infirmary. In both cases the principal phenomena induced are vertigo, dizziness of vision, ringing in the ears, often complete deafness, with confusion of ideas, occasionally coma with contraction of the pupil. At the same time the force and frequency of the heart's contractions are diminished, and the pulse, from being 120, strong and full, was frequently reduced in a few hours to 80 beats, which were soft and even weak. The skin at the same time becomes cool and often moist from slight diaphoresis. This sedative action on the heart is apparently the result of the comatose condition produced by the primary action on the brain, as is proved by the fact that the disappearance of the cerebral, induces cessation of the circulatory phenomena. In large doses,

therefore, quinine is a narcotic. Its action in intermittent fever, however, cannot be owing to this property. Of late years it has been called an anti-periodic, from the specific effects it exercises, not only on intermittents, but on all diseases which exhibit a tendency to return at periodic intervals, as certain cases of epilepsy, neuralgia, and even relapsing fever. This property is altogether peculiar, and is distinct from what ought to be understood by febrifuge, unless indeed the statements and views of Dr Dundas should be subsequently confirmed.

Quinine is also spoken of as being a tonic when given in small doses. This property seems to have been attributed to it on account of its bitterness, as well as its remarkable effects in the cure of ague. But whether it increases the appetite, stimulates the digestive organs, or in any other way operates by increasing the tone of the system and improving the nutritive powers, is a circumstance which, though generally adopted as true, admits of strong doubt. If quinine be a sedative in large doses, it is the only one of that class of remedies which is tonic in small doses. No doubt it is very frequently given to convalescents and weakly persons, who get better under its use, but whether this is owing to the quinine, or would not have occurred equally well without it, is a matter very difficult to determine. Of one thing I am satisfied, namely, that it is far inferior in tonic properties to many metallic and other vegetable drugs, and, consequently, a medicine with such known valuable anti-periodic properties, the supply of which also is yearly diminishing, should not be wasted in endeavouring to produce effects so very doubtful as the tonic virtues which have been ascribed to it. For many years, therefore, I have not given quinine as a tonic, and have yet to meet with a case where it is necessary to administer it in order to increase the strength of the system.

The General Treatment of Continued Fever which I have found most useful, and which you have seen practised in this infirmary, consists, during the stage of excitement, of giving saline antimonials, administering slight laxatives if occasion require them, and ordering the head to be shaved and cold applied. Wine and stimulants are required at a later period when the pulse becomes weak. In prolonged cases, the effect of pressure on the skin from decubitus must be carefully guarded against, whilst the different complications which arise will require careful management.

Salines and Laxatives.—At an early period of the disease, when the skin is hot and the pulse rapid and strong, the saline mixture generally ordered is the following :—℞. *Sol. Tart. Antim.* ℥ss ; *Sol. Ammon. Acet.* ℥ij. ; *Aquæ.* ℥vss ; *M. ft. Mist.*, of which a table-spoonful is to be taken every four hours. Should a laxative or purgative be required, castor-oil is the one usually employed. Water or thin lemonade may be taken *ad libitum.*

Cold to the Head.—The oppressive headach of fever is greatly alleviated by cold applications to the head. Indeed none but those who have experienced it can understand the feeling of relief and grateful sensation of ease which is in this way produced. The best method of applying cold I have found to be as follows :—A wash-hand-basin should be placed under the ear on one side, and the head allowed to fall over the vessel by bending the neck over its edge. Then from a ewer a stream of cold water should be poured gently over the occiput, and so directed that it may be collected in the basin, care being taken not to wet the dress or bed-clothes. It should be continued as long as it is agreeable to the patient, and repeated frequently. In hospitals, and more especially in fever-wards, this method requires too much attendance. You will have observed, indeed, that I seldom ordered cold to the head, experience having taught me that it was more frequently converted into warmth to the head. For notwithstanding every injunction to the contrary, all that is done in these cases is to moisten a piece of double rag or lint in cold water, and lay it upon the warm head of the patient. In a few seconds it is converted into a warm and steaming fomentation, and too frequently allowed to remain in

this condition for hours. Hence, unless cold can be applied properly (and in large hospitals that can scarcely be expected without procuring a nurse for every two or three patients) it is better not to order it at all. It has occurred to me, however, that a water-pipe might be conveyed round the walls of fever-wards, with a vulcanized india-rubber tube and stop-cock attached, so that with a little contrivance the patients might procure a flow of cold water and regulate it for themselves. I am satisfied that much relief would be in this way obtained.

To secure the application of cold efficiently, it is necessary that the head be shaved. In all severe cases this is indispensable. Such practice, however, is often stoutly opposed by the friends of young women, who are unwilling that they should lose a handsome growth of hair. I have occasionally compromised the matter by allowing the long hair to float in cold water, and act by capillary attraction on the scalp, so as to keep up a refreshing feeling of coolness.

Wine and Stimulants.—When after being rapid and strong, the pulse falters, becomes soft and weak, very often without losing its frequency, it will become necessary to administer wine or other stimulants. The quantity of wine usually given is from three to six ounces a day ; but in some cases marked by unusual depression, or when the individual has been previously accustomed to alcoholic drinks, a larger quantity, or instead, from one to four ounces of spirits may be required. Nothing is more difficult than to lay down rules as to the extent to which stimulants ought to be given in certain cases, or as to the period when they should be administered. The pulse, strength of constitution, previous habits of the patient, but above all the type of the prevailing epidemic, must be your chief guides. Nothing perhaps is more indicative of experience and practical tact in the treatment of fever than the judicious use of stimulants in this disease, and certainly there is no other method of acquiring the necessary knowledge than that of carefully watching their effects in a large number of patients. Among all the agents at your command, there are none which will enable you to conduct a case of fever to a favourable termination more successfully than stimulants, when properly managed. Indeed, it is easy to conceive that in a disease where loss of appetite, and abstinence from food, constitute essential phenomena, a period must arrive sooner or later, when artificial support is absolutely required. You should be careful, however, not to prolong their use more than is necessary. Very singular anecdotes still linger about the clerks' rooms of this infirmary of instances where whole bottles of whisky were consumed daily by fever patients ; and where, notwithstanding their recovery, owing to some mistake in the order-book, the whisky was still supplied, and disappeared with surprising regularity.

Regulation of the Diet.—During the early period of fever, the patient generally loathes all kind of food. Care should be taken, however, that after a few days have elapsed, slight nourishment should be taken in the form of drink, and diluted milk, toast and water, thin panada or similar fluids given, with a little toast or biscuit. Should collapse come on, pains should be taken that, together with the stimulants, chicken broth or good strong beef-tea should be administered. I am inclined to think that the danger from fever is not from over, but from under, nourishment, which, by reducing the strength, leaves the patient less capable of struggling with the subsequent collapse. I have especially noticed with regard to relapsing fever, that those who have fed well in the interval, have been less affected by the re-accession. The body is also drained of its saline constituents, whilst such as enter with the food are cut off ; hence I have found it useful to add a large amount of common salt to the beef-tea, which also renders it more sapid and agreeable to the patient, and serves to clear away the accumulation of fur and sordes that gather about the mouth. On the other hand, when convalescence comes on, we should take care not to indulge the appetite too much.

With regard to the complications of fever, I have nothing further to say,

than that they must be treated according to general principles, always keeping in remembrance that active depleting means are never useful, and seldom fail, by diminishing the vital powers, to augment the collapse and increase the danger.

SYPHILIS AND MERCURIAL POISONING.

Anne Bruce, æt. 24, admitted January 10th, 1852. Her face presented a most frightful appearance, being covered, as well as the neck and upper part of the chest, with circular masses of pustular scabs. These varied in size, from a fourpenny-piece to that of half-a-crown, in some places, several being crowded together. Some of the prominent scabs were dry, others soft, with fœtid pus oozing from their bases. In a few places they had fallen off, exposing circular, unhealthy-looking ulcers. Wherever the skin could be seen, it was of a fiery red colour, and puckered with old cicatrices. The lower lip was swollen and dragged downwards, and the left lower eyelid was ulcerated and everted. The metacarpal bones of the left hand were enlarged, and the skin covering them red and painful. No ulceration of the throat or other complaints, with the exception of weakness. External appearance highly cachectic.

The history she gives of her case is as follows :—About five years ago she contracted primary syphilis from her husband, who had suffered from a very malignant form of it in the West Indies. Shortly after, she was attacked with a minute pustular eruption of the skin. This shortly disappeared, but was succeeded by occasional blotches on the skin, which sometimes broke, but always went away slowly. Eighteen months after the commencement of the disease, one of these appeared on her chin, when, being alarmed, she came to Edinburgh. The practitioner she consulted placed her under a mercurial course, and she was salivated for six weeks. The disease in the face, instead of healing slowly as formerly, now ulcerated, and began to spread. Six months afterwards, she was again salivated for four weeks, but the whole of the lower half of the face was now involved, and she entered the clinical ward of the Royal Infirmary. She is confident that these are the only occasions on which she has taken mercury. She remained in the house upwards of a month, and went out with the face nearly well, from the use of topical emollient applications, and the internal use of small doses of iodide of potassium. Six weeks afterwards, however, she was exposed to cold and wet, when the blotches, scabs, and ulcers returned in the face, and gradually spread to the neck and chest, as formerly described.

She was ordered *four grain doses of Iodide of Potassium* in a mixture containing ℥i. *of Tr. of Cardamoms, and* ℥vij. *of compound infusion of Gentian.* The face was dressed first with a zinc lotion, afterwards with one of chloride of lime, and subsequently with an ointment of iodide of lead. Gradually the further ulceration was checked, and the ulcers healed, so that, on the 19th of February she was so much relieved, that she insisted on going out.

Commentary.—It is very rarely that we have an opportunity of seeing so frightful a case of mercurial syphilis as the one just noticed, which fully equalled many of the horrible representations I now show you in the work of Divergie. You will have observed from her history, that, previous to the exhibition of mercury, she was subject to the slow formation of boils, which, however, spontaneously disappeared. The moment her system became saturated with that drug, the boils and ulcers became stationary, and commenced spreading over the integument. This is so important a fact, that it induces me to direct your attention to the subject of syphilis generally.

The literature of syphilis is exceedingly rich. The origin of the word, the source of the disease, the time of its appearance, its subsequent course, and the identity of its different forms, at various times, have all been keenly disputed. Even at the present day, its exact nature and mode of treatment excite lively discussion; for such are the discordant facts reported, and such are the prejudices resulting from education, and *ex parte* statements, that it is extremely difficult to form an unbiased, not to speak of a correct, opinion. All, then, that

I shall venture upon, is to communicate some of my own reflections and observations on this subject.

Syphilis appears in different forms, which are generally considered as primary and secondary. It may, with more propriety perhaps, be divided into primary, secondary, and tertiary, as follows :—

Primary Syphilis.—

1. Balanitis.
2. Gonorrhœa,— { *Simple or ulcerative.* / *Acute or chronic.* }
3. Chancre.
4. Granular disease of os uteri.
5. Irritation in other organs,— { *Testes, Prostate, Rectum, Schneiderian Membrane, Conjunctiva, etc.* }

Secondary Syphilis of the—

1. Lymphatic glands,—*Bubo.*
2. Mucous membrane,—*Ulcerations.*
3. Skin,—*Ulcerations or eruptions.*
4. Eye,—*Iritis, etc.*

Tertiary Syphilis.—

1. Disease of bone,—*Exostosis, Caries, Necrosis.*

The forms of syphilitic disease which commonly fall under our notice, in the medical clinical wards, are such as affect the skin, fauces, and larynx. They all require the same constitutional treatment, but the two latter demand also local applications, some of which have been referred to when speaking of laryngitis.

All the different kinds of skin disease formerly described may occur in an individual affected with syphilis. They then become modified in their general appearance, course, and seats of predeliction. Thus it has been observed that the red colour, such as it appears in healthy persons, assumes a darker or coppery tint. This is especially observed in the scaly eruptions, the patches of which are also smaller, while the scales are thin, and of a gray colour, often approaching black. The pustular scabs are hard and thick, of a dark greenish or black colour, furrowed on the surface, and deep in the skin. The ulcers are deep, circular, with hard and callous edges. The cicatrices are unequal, round, or spiral, white and depressed. These eruptions may occur all over the surface, but are most common on the forehead, face, nose, back, and shoulders. In children they generally assume the form of maculæ or of ulcerations ; in adults, of tubercular and scaly disorders, although ulcers are also very frequent.

Diagnosis of Syphilis.—It has been said by some persons that they can readily detect a syphilitic from all other skin eruptions. But I have known errors made in this respect by the most experienced and eminent dermatologists, one of which I may relate.

A young gentleman, on rising one morning, found himself covered with an exanthematous eruption. He had dined out the previous day, and indulged in eating more than usual. He applied to an English physician, practising in Paris, who pronounced it to be urticaria, recommended a dose of salts, and assured him that it would disappear in a couple of days. Some friends, however, advised him to consult M. Biett, at that time chief physician to the Hopital St Louis, and certainly one of the most experienced dermatologists in Paris. He did so, and the eruption was stated at once to be syphilitic, and a course of mercury recommended. It was with the utmost difficulty that his English medical adviser could prevail upon him to wait two days before commencing the mercurial treatment, when, however, he had the pleasure of seeing his diagnosis justified, by the disappearance of the eruption. Now I need not say that if such an error could occur to one so experienced as M. Biett, how much more

readily may it happen to a practitioner comparatively unacquainted with such disorders.

The same difficulty occurs with primary and secondary syphilitic ulcers. The question here is, is there anything in the aspect of the sore itself which will enable us to determine its nature? Here also I have seen the greatest mistakes made by the most experienced surgeons. M. Ricord was so doubtful, after long practice, of the characters of a common chancre, that he commenced a series of inoculations to determine which was, and which was not, a true venereal sore. I am satisfied also, that individuals, whose systems have been impregnated with mercury, frequently have ulcers, which are constantly mistaken for venereal ones, although really the results of a poison with which the body is impregnated. The following case, which I observed sixteen years ago, was the first which strongly impressed my mind with this truth.

A girl, seven years of age, entered the surgical hospital in 1836. She had a round ulcer over the tibia, about the middle of the left leg. It presented all the characters of a venereal ulcer, as described by Hunter. On enquiry, it appeared that her bowels having been somewhat deranged, the mother had gone to a druggist's shop, and asked for some opening powders. She received twelve, which contained a white, finely powdered substance. One was given morning and night. In four days profuse salivation came on. The whole dozen powders were given however, and a cachectic state was induced. Owing to some accident, she received a violent blow on the leg, and the ulcer mentioned made its appearance. There had never been a venereal taint in the family, and the parents were perfectly healthy. The clinical professor declared publicly, that had the girl been seventeen, instead of seven years old, no asseverations on her part could have persuaded him that the sore was not syphilitic.

Thus, then, it is only when the symptoms arise in a certain order, that we can positively declare syphilis to be present. If an individual has chancre, which is followed by bubo, or ulcerated throat; and this is accompanied by, or precedes, eruptions on the skin, then we may feel pretty confident. Again, when deep-seated pains in the bones follow the previous symptoms, we may consider them to be syphilitic. The circumstance of an osseous disease more frequently affecting the shaft than the extremities of a long bone, will serve to distinguish syphilitic from scrofulous disease, and the existence of caries in conjunction with the peculiar ulcerations formerly alluded to, will confirm our suspicions. You should remember, however, that great caution is always required. The common idea that the gonorrhœas, or excoriations in men, which often follow impure connection, are a proof of disease in the female, has led to great error; as it is now ascertained that they may occasionally arise from the presence of the menses, some unusually acrid discharge or other innocent cause. A hasty opinion given to the effect, that this or that eruption is syphilitic, has introduced discord into families, and produced incalculable mischief. The tertiary syphilitic symptoms also have frequently been confounded with the deep-seated pains of rheumatism, neuralgia, malacosteon, etc. Moreover, if such opinion leads to the entering upon a mercurial course, the original disorder is often replaced by an artificial one, often more destructive in character, which is again confounded with syphilis, and so the error is perpetuated.

Mode of Communication.—Actual contact from impure connection is the most common mode by which syphilitic sores are communicated. A gonorrhœal discharge also applied incautiously to the conjuctiva or other mucous membranes, will excite inflammation in them. The secondary forms of the disease are always the result of inoculation; but this may arise, not only from the poison being absorbed directly from a primary sore, but may be communicated by the mother to the fœtus in utero,—by the infant to the nurse,—and again by the nurse to the infant. The following case, which was most care-

fully investigated, and was the subject of legal proceedings, illustrate how nurses may be affected by syphilitic infants.

In 1842, the late Dr W. Campbell, brought to me a woman with a child in her arms, to obtain my opinion, whether a skin eruption on the latter was or was not syphilitic. I pronounced that it was, and that the woman should cease to nurse it, although her nipples at that time were in no way affected. The child was the offspring of respectable parents, and had been sent to her to nurse. In consequence of my opinion, the infant was returned to the friends, whose medical attendant maintained the eruption to be non-syphilitic. The woman who applied to me (nurse 1,) was received as a wet-nurse into another family, and the child was sent to another nurse (nurse 2). In a week the child died; and a few days afterwards, nurse 2 was attacked with sore nipples. Nurse 1, shortly after entering her new situation, also perceived sores round her nipples; and the medical attendant of the family, after consultation with me, caused her to be discharged. She, in consequence, brought an action against the medical man, who had caused the syphilitic infant to be sent to her, and mistaken the disease. The lawyer she employed, then took me to visit nurse 2, whose whole body was covered with a syphilitic tubercular eruption. Both nurses ultimately succeeded in obtaining compensation from the medical attendant.

Pathology.—Syphilis is caused by a poisonous virus, which, mixing with the blood, taints the constitution, and predisposes it to those forms of secondary and tertiary disorders formerly alluded to. The nature of this virus is involved in the same mystery as that of other animal poisons. All that we know of it is from an observation of its effects. Sir A. Crichton, adopting Liebig's view of a catalytic action produced in the blood, pointed out, in 1842, that this catalytic action was soon destroyed in cases of scarlatina, small-pox, and similar acute diseases. Here "the fever, which destroys both the desire for food and the process of chymification, and consequently the supply of new elements for the further formation of new virus, is cut off. But in syphilis and yaws, which do not affect the brain or vital functions for a long time, the patient, by daily taking food in abundance, supplies every day new elements for the production of fresh quantities of poison, and consequently the disease goes on and is protracted indefinitely." This theory is supported by the comparatively mild character of syphilis in warm climates, where the natives live chiefly on vegetable food, and is abundantly proved by the good effects of a low diet and the most simple means, when contrasted with the effects of so-called specifics.

For my own part, I believe that the virus of syphilis, if left to itself, and the health of the patient attended to, will generally wear itself out. Unfortunately we are only commencing to observe the natural progress of syphilis, and consequently we are unable to determine how long, under ordinary circumstances, it takes to accomplish this. So far as I know we have no specific for any kind of animal poison, for you will remember that Jenner was of opinion (and there can be little doubt that he was correct), that in giving vaccination to man, he was merely giving him small-pox in a modified form. The idea that mercury is a specific for the syphilitic poison, and the incalculable mischief it has occasioned, will constitute a curious episode in the history of medicine at some future day. It is now well known that the poison of mercury produces a cachectic disease and secondary sores in the body which have been to a great extent mistaken for those of syphilis. It consequently has happened that mercury has been given to cure primary sores, has produced a constitutional disorder which has been mistaken for syphilis; more mercury has then been administered, which has added to the mischief, and so the disease has been perpetuated. The real fact, however, is, that the syphilitic poison is no exception to the general rule which informs us that all contagious diseases of the blood run a certain course, and that we have not yet discovered a specific cure for one of them. The great proof of this is that the intensity

of the disease in modern times has declined exactly in proportion as its treatment by mercury has diminished, and the disorder been left to follow its natural course. When we treat syphilis on the same principles that we do scarlatina and small-pox, it will prove infinitely less fatal than those disorders.

Treatment.—The treatment of syphilis may be said to be of two kinds, namely, the simple and the mercurial. The profession are rapidly deciding in favour of the first, although some of its members still give mercury in inveterate cases. Many of those we meet with, therefore, have taken the drug, and we have to eradicate the effects of the mineral poison as well as that of the original disease.

The Simple Treatment is divided into internal or medical, and external or surgical. The first consists in the observation of certain hygienic rules, and the employment of general therapeutic means. The diet must be light and mild,—meat and all stimulating viands retarding the cure; even with the lightest diet, the hunger should never be quite appeased. The regimen must be the more diminished and rigid in proportion to the youth and vigour of the patient. Diluent beverages, decoctions of barley, liquorice, and linseed, alone or mixed with milk, should be taken freely, to the amount indeed of several pints a day. Perfect repose must be secured by confinement to bed. Constipation must be obviated by the use of emollient clysters or mild laxatives. The air should be maintained at the same temperature—this is an indispensable precaution in chronic, consecutive, and mercurial affections. Exercise is only useful in the convalescent stage. In chronic syphilis, however, it may often be carried to fatigue with advantage. Tepid baths, repeated three or four times a day, are always attended with advantage. General blood-letting is often required where the primary disease is intense, or the system excited and the patient plethoric, but should not be used indiscriminately.

In the external or surgical treatment, strict attention to cleanliness, and the position of the diseased parts should never be lost sight of. Emollient decoctions or fomentations, or dressings of simple cerate, are the best applications, and the dressings should not be too frequently renewed. Leeches are generally necessary. The greatest benefit is derived from the external use of a concentrated solution of opium (in the proportion of about ʒij to ℥j of water); it soothes excessive irritability in all cases. When the suppuration is moderated and the surface of the ulcer cleansed, stimulating dressings, consisting of solutions of the sulphates of alum and copper, the nitrate of silver, and sub-acetate of lead, favour cicatrization.

In inveterate cases, more especially those labouring under tertiary symptoms, the iodide of potassium was introduced by Dr Wallace of Dublin, and used by him with considerable success. I have myself given it in numerous cases with benefit, in doses of 5 gr., three times a-day, conjoined with emollient applications to the affected parts.

The *Mercurial treatment* consists in keeping up slight salivation, by means of the internal administration of blue pills or some form of mercury, sometimes conjoined with mercurial frictions or fumigations, at least for the space of a month. This physiological action of the drug may be produced by administering any of its preparations continuously in small doses. If combined with opium, they act less on the bowels, and more on the system generally.

It is necessary during its action, that the patient do not expose himself to cold. A certain irritability is produced, and the constant soreness of the gums, the metallic taste in the mouth, not to speak of the inconveniences of profuse salivation which occasionally occur, render this species of treatment anything but agreeable to the patient.

Both kinds of treatment have now been extensively tested. In the year 1822, the Royal Council of Health in Sweden, having been charged by the king to conduct a series of experiments upon the different modes of treating venereal diseases, reports from all the civil and military hospitals were ordered to be drawn up annually. These reports establish the inconveniences of the

mercurial system, and the superior advantages of the simple treatment. In the various hospitals of Sweden, 40,000 cases have been under treatment, one half by the simple method, the remaining half by mercury ; the proportion of relapses has been, in the first instance, seven and a half, in the second, thirteen and two-thirds, in one hundred. Dr Fricke's experiments in the Hamburgh general hospital were first made public in 1828. In four years, out of 1649 patients of both sexes, 582 were treated by a mild mercurial course, and 1067 without mercury ; the mean duration of the latter method has been 51 days, and that by mercury 85. He found that relapses were more frequent, and secondary syphilis more severe, when mercury had been given. When the non-mercurial treatment was followed, they rarely occurred, and were more simple and mild when met with. He tells us that he has treated more than 5000 patients without mercury, and has still to seek cases in which that remedy may be advantageously employed. He has never observed caries, loss of the hair, or pains in the bones follow his treatment, and in all such cases which have come under his care, much mercury has been given.

In 1833, the French Council of Health published the reports sent in by the physicians and surgeons attached to regiments and military hospitals in various parts of France. Some of the reports are in favour of a mild mercurial course, others in favour of simple treatment. They all agree in stating the cure by mercury to be one-third longer than by the other treatment. At Strasbourg, mercury was only given to very obstinate cases. Between 1831 and 1834, 5271 patients had been thus treated, and the number of relapses and secondary affections calling for the employment of mercury, has been very small. No case of caries, and only one or two instances of exostosis, have been observed. Full reliance may be placed on these facts, as regiments remain in garrison at Strasbourg for five or six years.

In the various reports now published, more than 80,000 cases have been submitted to experiment, by means of which it has been perfectly established that syphilis is cured in a shorter time, and with less probability of inducing secondary syphilis, by the simple treatment.

These facts are now very generally admitted, and malignant syphilis is gradually disappearing. Twenty years ago, the most frightful secondary and tertiary cases were met with, and the usual treatment was profuse salivation. At present, such cases are rare. Abroad, owing to wise police regulations, the disease is infinitely more innocent even than it is at present in Scotland ; and under the salutary influence of a mild and simple treatment, its virulence is daily abating.

In appreciating the value of this important revolution in practice, we should not forget to eulogise those who had first the boldness to introduce it. The credit of this is mainly due in this country, to Mr Fergusson, and other British army surgeons, who practised it during the Peninsular campaign (Medio-Chir. Trans., vol. 4)—to Mr Rose of the Coldstream Guards (Ibid, vol. 8)—and to the late Professor John Thomson of this University, whose writings and lectures on this subject were mainly instrumental in convincing Scotch practitioners of the evils of mercury in this disease. In England, the Hunterian theory and practice have been deeply rooted, and in Ireland have been supported by the writings of Carmichael and Collis. The gigantic experiments made abroad, however, ought to convince the most sceptical—if not, let him compare what syphilis is in Scotland with what it was, and especially observe that we never see an instance of the disease such as that now in the ward, unless the patient's system has been contaminated with mercury.

Part Fifth.

MEDICAL NEWS.

PHYSIOLOGICAL SOCIETY OF EDINBURGH.

The following was omitted by mistake in the report of Meeting IV. of the Society, January 3, 1852:—

Dr Cobbold demonstrated a form of cellular tissue occurring in Banksia, Grevillia, and other allied genera, which he believed to be peculiar to the Proteacea. Dr C. more especially drew the attention of the Society to the remarkable manner in which the "*hairs*," situated on the cone-like heads of the flowers of Banksia were arranged and developed. The hairs originally consisting of oval-elongated cells became shaped and "*stalked*," this taking place by the *cell* bending upon itself, the two ends growing outwards and approximating; the "nucleus" alone remaining adherent to the plant, and extending itself so as to form a kind of stalk.

MEETING IX.—*March* 13, 1852.—Professor BENNETT, P., in the Chair.

1. *Dr Bennett* exhibited to the Society a series of models by Auzouz, illustrative of the development of the Mammalian ovum. He also exhibited vascular preparations, one of the liver, the other of the lung, prepared by Harting.

2. *Mr Struthers* read a communication on the foramen ovale, etc., in relation to the circulation in the fœtus. (This communication will be published in a future number.)

3. *Mr Drummond* exhibited a preparation for the purpose of showing that if an alcoholic extract of the brain or nerves be made, and the clear solution evaporated, the fatty matter as it is deposited, assumes the form of rings and loops, with double contour, which presented the same appearance as that assumed by the white substance of Schwann when expressed from the nerve tubes.

4. *Mr Adam* detailed to the society the particulars of his dissection of an anencephalous fœtus, in which there was also a very imperfect development of the right superior extremity. The cranial and spinal arches were undeveloped; the spinal cord also was deficient, except in the sacral region, where at least a nervous expansion existed, with which the sacral nerves were continuous. On opening the collapsed membranous cranial sac, "which had probably contained fluid," a small quantity (about 3 grs.) of pus-like fluid was found in the middle fossa of the base, which presented under the microscope the compound granular corpuscles "usually seen in cerebral ramollissement." The other appearances were such as usually occur in anencephalous fœtuses. The abdominal cavity presented the marks of intra-uterine peritonitis. The intestines, omentum, liver, and diaphragm were covered with coagulable lymph, and in most places adherent. The spleen and supra-renal capsules were absent, as is usual, according to several authorities, in anencephalous fœtuses. The stomach was imperfectly developed.

From the above facts, Mr Adam was inclined to agree with those authors who considered the cranial and spinal lesions a result of hydrocephalus; and also with those who regarded inflammatory action within the abdominal and thoracic cavities as a cause of evisceration.

Mr Struthers and Dr Cobbold were appointed to report on this communication.

MEETING X.—*March* 27, 1852.—Professor BENNETT, P., in the Chair.

1. The following report of the committee on Mr Drummond's communication on the arrangement of the fibres in the fœtal arteries was read by Mr Struthers:—

"We are satisfied of the correctness of Mr Drummond's statement, that the middle coat of the arteries is composed of fibres arranged spirally, as found and demonstrated by him, in the fœtal calf eighteen inches long.

"Mr Drummond has shown to us that an artery, thus obtained, may be readily uncoiled. The aorta thus taken was uncoiled in its whole thickness, and part of it also layer after layer.

"From this we conclude, that he is right in describing the middle coat to be composed of fibres, or bundles of fibres, arranged spirally.

"The external coat of the artery does not seem to be yet developed. In the full-grown human fœtus, Mr D. finds that he is unable to uncoil the artery in the above manner. The external coat is distinct.

"On the healthy *adult human artery* (the external iliac artery was the vessel examined) Mr Drummond demonstrates a distinctly spiral arrangement of the whole fibres of the external coat, the spiral bundles decussating each other. A bundle may be raised and traced round the artery two or three times, passing spirally with a considerable degree of obliquity, and interlacing with others passing spirally in an opposite direction.

"In the artery of the full-grown human fœtus, and in that of the adult human subject, the fibres of the middle coat could not be found to have any spiral arrangement. Larger or smaller bundles when raised tore off circularly, with only a slight interchange of fibres, but no indication of formerly existing spiral arrangement could be demonstrated."

2. The following report on Mr Adam's paper was read by Mr Struthers:—

"The account of the dissection in this case accords with what is usually found in anencephalous fœtuses.

"We do not find in it any proof that the absence of the brain and spinal chord had been due to their absorption or destruction from hydrocephalus; the small quantity of puriform fluid, found in the base of the cranium only, seems to prove merely that some inflammatory action had existed here.

"The appearances in the abdomen do not appear to us either to support or oppose the view of Dr Simpson and others who regard evisceration and eventration to have been caused by inflammatory action, but merely to prove that there is such an affection as intra-uterine peritonitis.

"We are of opinion that Mr Adam's paper contains sufficient evidence of his ability as a writer and observer, and have much pleasure in suggesting that he be admitted a member of the Physiological Society." March 25, 1852.

(Signed) "THOMAS SPENCER COBBOLD.
"JOHN STRUTHERS.

3. *Dr Bennett* exhibited a series of preparations which he had collected in the years 1846-7, to illustrate the changes which the spleen underwent during typhoid fever. These changes consisted in various-sized discoloured portions, depending on a degeneration of the organ. Two of the preparations showed, that in some cases the altered portions sloughed and separated; another showed that it occasionally puckered and shrunk up, forming a cicatrix.

4. *Dr Dobie* showed specimens of the *sarcina ventriculi* and *torula cerevisiæ* occurring in the fluid vomited by a patient in one of Dr Robertson's wards in the Royal Infirmary. Dr D. stated that the sulphite of soda had at once checked the vomiting. Dr D. also mentioned that in a case occurring in private practice, he had examined the vomited matters with the microscope, and found the yeasty fluid to contain an enormous amount of the torula cerevisiæ without sarcina. In this latter case the use of the sulphite of soda had been remarkably successful, no recurrence of the vomiting taking place after the first dose of medicine. It was remarkable that the latter patient vomited about 16 ounces of the yeasty fluid every alternate day.

MEETING XI.—*April* 10, 1852.—Professor BENNETT, P., in the Chair.

1. *Dr Bennett* exhibited a foreign body expelled from the nostril by a patient of Dr Littlejohn (Selkirk), which, on microscopic examination was found to be a shaving of fir-wood encrusted with calcareous matter.

2. A specimen of serum of blood was shown by Dr Bennett; it was taken from a chlorotic patient, and contained a bluish-green deposit, the nature whereof he was not acquainted with. Mr Drummond was appointed to report.

Dr Murchison read the following communication on the experiments of Dr Sperino on the inoculation of the syphilitic virus:—Many of the members of the Physiological Society are probably aware that the subject of syphilisation, or the inoculation of the syphilitic virus, is one, which for some time has been engaging the attention of several of the medical societies upon the Continent, and, among others, that of the Academy of Medicine of Paris. The experiments of John Hunter and M. Ricord had shown that inoculation might be employed as a test for distinguishing between primary and secondary syphilitic sores, true chancres developing themselves from the inoculation of the discharge taken from the former class of ulcers only; but a French physician, M. Auzias Turenne, was the first to announce the extraordinary fact, that the oftener the inoculation of matter from primary sores is repeated in the same individual, he gradually exhibits a less tendency to the reproduction of such sores, until at last the inoculation has no effect at all in producing them. The experiments which led M. Auzias Turenne to this extraordinary and important conclusion, were all made on the lower animals, principally monkeys, and they were detailed by him in a memoir on the subject laid before the Academy of Sciences of Paris, Nov. 18, 1850. Since then, similar experiments have been made on the human body by Dr Casimiro Sperino, who for a period of fourteen years has been the head surgeon of the "Regio Sifilicomio," or Royal Syphilitic Hospital, in the neighbourhood of Turin, containing upwards of 200 beds, allotted entirely to females affected with syphilis, and who has therefore had ample opportunity of making himself thoroughly acquainted with this class of surgical diseases. On the 17th of last December I visited the Regio Sifilicomio in company with Dr Sperino, and, through the kindness of that gentleman, I there had an opportunity of examining for myself upwards of thirty females who had been subjected to the process of syphilisation. In consequence of this visit, I have been induced to draw up the following short abstract of Dr Sperino's experiments and observations, as contained in a memoir entitled, "Sifilizzazione Nell' Uomo," read by him before the Medico-Chirurgical Society of Turin on the 23d of March 1851, and in another memoir bearing the same title, contained in the "Gazetta Medica Italiana" for the 8th of last November, hoping that it will be considered not unworthy of attention and consideration:—

In the first place, then, Dr Sperino states, that, previously to his having read of the experiments of M. Auzias Turenne, he had observed among the females admitted into the Regio Sifilicomio, that the greater the number, the extent, and the duration of the primary sores, the less liability was there to the development of secondary symptoms. Thus town prostitutes, who were most liable to new infections, and to the most virulent sores, and who were admitted into the hospital several times in the course of one year for primary venereal ulcers, were very rarely found to become affected with secondary syphilis, while, on the contrary, prostitutes from the provinces affected with a single small primary ulcer almost invariably were attacked with secondary syphilis three or four months after the primary infection. Moreover, he had observed that in females affected with open buboes, in whom he had inoculated pus from the inguinal sores, in order to demonstrate their identity with the primary ulcers in the vulva, and in this way multiplied the number of ulcers, all of these, both the original and the artificial, quickly cicatrised, and no secondary symptoms manifested themselves.

Perceiving, as he thought, an analogy between these observations and the results of the experiments of M. Auzias Turenne, Dr Sperino undertook an exten-

sive series of similar experiments upon the female patients of the Regio Sifilicomio, the results of which he has published in the memoirs above-mentioned.

Every one of the females subjected to these experiments was already labouring under either primary or secondary syphilis. The matter which was inoculated was taken from a primary ulcer, situated either on the same or on another female, and presenting all the characters of an indurated "Hunterian chancre." The inoculation was made with the tip of a grooved lancet on some part of the chest or abdomen, at from three to six points at one time, and repeated once or twice in the week. The punctures were immediately covered over with a strip of adhesive plaster. On the third or fourth day a syphilitic pustule appeared at the side of each puncture, and on this bursting, an ulcer was developed with all the characters of the primary sore.

Now, Dr Sperino states that he has found in every case, without a single exception, that the first set of artificial sores were larger, deeper, more indurated, more inflamed, yielded more discharge, lasted longer, and left behind them larger cicatrices than the second set. Again, the second set of inoculations bore a similar relation to the third, the third to the fourth, and so on, until at last, after a series of inoculations (generally eight or ten), these no longer produced any effect, though repeated again and again in various parts of the body, with matter, which, in other females not previously inoculated, produced large primary ulcers. The number of inoculations necessary to produce this saturation with syphilis, or "*saturazione di sifilide*" as Dr Sperino expresses it, was found to vary considerably, but fewer were always required in the case of those females, who had for a long period been suffering from large chronic ulcers, than in those affected with small recent ulcers.

Dr Sperino also ascertained from numerous experiments, that the different characters of venereal sores, simple, indurated, and phagedænic, depended not on the quality of the inoculating virus, but on the condition and constitution of the individual, the same virus producing different sores in different individuals.

Dr Sperino states that no bad effect has ever followed these inoculations, provided care was in the first place taken to ascertain that no inflammatory process was going on in any part of the economy. The only resulting inconvenience, he says, is that of the unseemly cicatrices which the ulcers leave behind them, an inconvenience, however, which he considers of little moment, and thinks may be quite disregarded, provided the inoculation is made in parts of the body not ordinarily exposed to view.

Dr Sperino, having thus confirmed the experiments of M. Turenne in reference to the human subject, proceeds to give some reasons for employing syphilisation as a mode of cure for primary and constitutional syphilis. In all his experiments nothing but soothing applications was applied to the sores, and no constitutional treatment was had recourse to, with the exception of baths and cooling drinks, yet he found that the original primary ulcers, if recent and of small size, began to heal as soon as any of the artificial sores were established; while very large chronic indurated ulcers, which had lasted two or four years, and which had resisted courses of mercury and iodide of potassium, and repeated cauterizations with nitrate of silver, pernitrate of mercury, Vienna paste, and excision of the ulcerated surface, also quickly cicatrised after a few inoculations.

Time and careful observation of facts, Dr S. remarks, must decide how long this immunity from contracting syphilis will last, and whether or not the cure is a permanent and radical one. In reference to this point, he states in his memoir in the "Gazetta Medica Italiana," that, out of fifty females dismissed from the hospital, who had previously been subjected to the process of syphilization, seven only had returned, though formerly these patients had been admitted several times in the course of the twelve months. Of these seven, two only had contracted a fresh syphilitic ulcer, which in both cases was small, and not indurated. In one of these two, the process of syphilization had not been carried to its full extent, while the other had exhibited unusual obstinacy in taking on the immunity from infection. Moreover, Dr S. remarks that the

number of patients in the hospital, which, from the commencement of 1850 up to June 1851, considerably exceeded two hundred, was, in November of last year, reduced to one hundred and twenty-six, without there being any other assignable cause for this extraordinary diminution, than the beneficial effects of the syhphilization. He thus considers syphilization, not only as a mode of cure of syphilis already existing, but also as a preventative of secondary symptoms, and as a prophylactic against subsequent attacks.

The conclusions arrived at by Dr Sperino have met with great and decided opposition by some of the leading men in Paris, especially by M. Ricord and M. Diday; and M. Ricord indeed mentions a case in the "Gazette Medicale de Paris" for the 22d of last November, in which the oftener syphilization had been repeated, the greater had been the tendency of the ulcers to assume a phagedænic character. From only having had one opportunity of visiting the Regio Sifilicomio at Turin, it was of course impossible to satisfy myself of the validity of Dr Sperino's observations and experiments; yet, in justice to Dr S., I must remark that, from the examination of about thirty cases, I felt no doubt that the last inoculations produced far less inflammation and ulceration, and left behind them much smaller cicatrices, than any of the previous inoculations; so that I cannot refrain from thinking, that Dr Sperino has had some grounds for the startling propositions announced in his papers on syphilization. I greatly fear, however, that, even allowing all the observations of Dr S. should be ultimately confirmed and recognised (which is far from probable), very few patients would be found, who would allow their bodies to be disfigured by the numerous and often very large cicatrices, necessary to produce what he styles, a complete "saturation with syphilis."

During my residence in Turin, a committee had been appointed by the Medico-Chirurgical Society of that capital, to investigate Dr Sperino's experiments. The results of their investigations I have not heard; but as soon as they are communicated to me, I shall not fail to lay them before the Society. In the meantime, I think the subject is one of sufficient interest and importance to induce those who have the advantage of treating syphilis on the large scale, to repeat the experiments of Dr Sperino.

It would be interesting to ascertain how far it is to be attributed to the syphilization alone, by instituting three sets of experiments:—Having recourse to syphilization only in one class of patients, as is the practice of Dr Sperino; combining it with the ordinary mode of treatment in a second class; and in a third class, applying only soothing applications to the sores, giving baths and cooling drinks, and attending to the general health. In this way we would be enabled to form some idea, as to whether Dr Sperino's success is attributable to his peculiar plan of practice, or to his abstaining from those remedies, which often do more harm than good in the treatment of syphilis.

Dr Bennett observed that the patients on whom these experiments were performed ceased to take mercury, which it seemed was otherwise universally administered. It appeared to him probable that the good effects of the inoculations might be attributed to this circumstance.

4. *Dr Cobbold* exhibited specimens of the dried skeleton of the Hyalæa Tridentata, and made some remarks on the anatomy of this animal.

5. *Dr Cobbold* also exhibited numerous drawings and a dissection of the muscular system in the goose (anser domesticus), and made some remarks on the myology of the aves generally.

6. *Dr Murchison* exhibited two specimens of Tænia Solium, passed by two patients in the Clinical Wards, after taking the extract of male shield-fern.

MEETING XII.—*April* 24, 1852.—Professor BENNETT, P., in the Chair.

1. *Dr Bennett* mentioned, that since last meeting he had learnt that the blue deposit contained in blood then exhibited to the Society, consisted of the colour-

ing matter of blue ink, which had been added by the patient for the purpose of imposition.

2. *Dr Cobbold* exhibited specimens of moss taken from a tree at Port-Philip.

Dr Bennett made a lengthened Report on the present state of Helminthology, in which the recent researches of Siebold, Steenstrup, Dujardin, Van Benedin, and Blanchard, were described. The drawings of Dr Henry Nelson, contained in his Thesis presented to this University in 1850, were exhibited, showing the development of the tænia crassicollis of the cat, from the cysticercus fasciolaris of the mouse, as well as those illustrating the development of the ascaris mystax. Lastly, an account was given of the recent experiments of Dr Kuchenmeister, and an allusion made to the researches of Dr Schubert of Utrecht.

MEETING XIII.—*May* 8, 1852.—Professor BENNETT, P., in the Chair.

1. *Dr J. W. Begbie* exhibited a stomach, the pyloric extremity of which was very greatly thickened and enlarged. On its exterior aspect there was a distinct triangular-shaped tumour, almost entirely adherent to the coats of the stomach. Internally, the mucous membrane of the organ was thickened and corrugated, in some places ulcerated. The pyloric orifice was not contracted, but on the contrary dilated. The external tumour, when cut into, presented the appearance of encephaloid cancer, and on pressure yielded a milky juice. Under the microscope, no distinct cancer cells had been found, but numerous cells, resembling pus-corpuscles, only of larger size. The tumour adherent to the stomach had at times been distinctly felt *before* death.

2. *Dr J. W. Begbie* showed a specimen of the Huile de Cade—Oil of Juniper—which he had recently received from Paris. This oil had latterly been much employed in the Parisian hospitals as an external application in the treatment of various affections of the skin and of obstinate ophthalmia, etc. Dr Begbie proposed to institute an inquiry into the comparative therapeutic virtues of the oil of juniper and the other preparations of tar.

3. REPORT ON DR DOBIE'S RESEARCHES ON THE STRUCTURE OF MUSCLE.

The primitive fibrilla presented the appearance of a cylinder bounded by two distinct margins, and consisting apparently of a series of dark and light particles arranged alternately, each light particle being crossed by a dark hue. The outer margin of the dark particles corresponded to the lateral margins of the cylinder or primitive fibril, thus extending across the entire breadth. Along the outer margin of the fibril was seen a distinct white band or space corresponding to what is termed by Harting '*the band of diffraction.*' Viewing this band as a portion of the primitive fibril itself, instead of regarding it merely as an optical phenomenon, the dark particles above referred to would seem to be surrounded on every side by a white space, and to present somewhat the appearance of nuclei, while the surrounding clear space, formed laterally by the diffraction band, would represent the cell wall. In this way the primitive fibril might, as Dr Carpenter figures it, be considered as formed by a series of secondary nucleated particles. This view, however, seemed to be opposed to the following observations:—1st, That in the preparations exhibited by Dr Dobie, the clear space is not broader than the dark. 2d, That the dark particles extended quite across the fibril on each side as far as the band of diffraction. 3d, That the line which subdivides the clear space, and which, according to the view of Carpenter, Lealand, Sharpey, and Wilson, seems to indicate the points of contiguity of the secondary nucleated particles, did not appear to extend farther across the fibril than the dark particles themselves, and did not extend, as it has been often figured, across the diffraction band.

(Signed) JOHN BARLOW.
JAMES DRUMMOND.
THOS. S. COBBOLD.

The following extract, translated by Dr Robertson, from Harting's work on the Microscope, will explain what has been mentioned as the diffraction band :—

"This is the place for directing attention to some phenomena, the necessary consequence of the course of the rays of light through and along objects placed in the microscopic field of vision, and which have already caused individuals, unacquainted with their nature, to fall into numerous errors. I treat, in the first place, of the *little bands* (coronæ) (halo) (*lijntjes*), caused by diffraction and consequent interference, as has been already shortly mentioned under section 195.

"This phenomenon any one who has a good microscope can easily observe, and the more perfectly the better the instrument ; for the distinct definition of the diffraction band keeps pace with the correction of the aberrations, the margins of the halo becoming sharper, in proportion as those of the image are clearly seen.

"In order to become familiar with the appearance, the best plan, to avoid error, is to place in the field objects with dark and sharp outlines,—air-bubbles are well suited for this purpose. The border of the object will then be seen to be bounded by a clear halo of light, which in its turn is included in a darker band, almost as if the object were surrounded by a thin membrane ; and in point of fact it has been often regarded as such, and even described and figured—an error the more pardonable since the distance of the dark diffraction line from the true margin of the object increases with the magnifying power employed, just as a true membrane should seem to become thicker and thicker. Frequently not only one, but two, three, or even four, such bands are perceived, just as in ordinary diffraction phenomena; and when the magnifying power is high, the margins of the bands have likewise prismatic colours. The band next the border of the object has always the darkest tint. To see it well, requires a certain management of the illumination. It is not true, as some have asserted, that these bands are merely due to excessive illumination ; in such circumstances, they on the contrary vanish, and become visible again when the field of vision is more feebly illuminated. They thus appear to follow quite the same law as all very transparent bodies of low refracting power; and it is a vain attempt to seek to remove them by special contrivances applied to the illuminating apparatus (see § 195) ; at the moment when they cease to be visible, objects the most difficult to define vanish too. And indeed, their removal is unnecessary, for there are about these bands peculiarities—not easy to describe it is true—sufficient to prevent any practised observer from being mislead by them. Their extreme frequency is even a sufficient guarantee against error. Besides, they are only visible by transmitted and never by reflected light, which is sufficient to explain their nature to one acquainted with the theory of diffraction (interference), for by transmitted light the objects form shadowy images in the field of vision, while true light-pictures are the result of reflected illumination. Alternating these modes of illumination, consequently, is in many instances a mode of determining the true cause of such bands.

"These diffraction bands may be formed in all circumstances when rays of light pass by the borders of an object. Whenever, then, many small bodies are situated in the field near each other, the diffraction bands from their opposite sides touch or run into each other, but as they are always faint when illuminated with diffused light, in such cases they are very little seen. The case is quite otherwise when, through a very faintly transparent object, the sun's rays are purposely made to pass directly from below. The rays then undergo among the different minute parts of the object interferences which become distinctly visible ; sometimes the appearance presented is as if the particles were surrounded with diffraction bands, not dark, but of prismatic hues. These diffraction bands, melting into those near them, give the whole field the appearance of little balls, vessels, or winding tubes. With artificial light, not previously rendered diffuse, the same phenomena are visible, but in less degree. It is known that some of the earlier observers took these balls, vessels, and tubes, for true objects. But when one adopts the rule never to *seek to make objects transparent* by letting a strong light pass through them, and to dispense altogether with illumination by

the direct solar rays, he runs no danger of being led into such mistakes."—*Harting in Het Mikroskoop*, D. 11, p. 58, *et seq.*

MEDICO-STATISTICAL ASSOCIATION.

The proceedings in the Medico-Chirurgical Society of Edinburgh, relative to the scheme for the Registration of Deaths, have issued in the formation of a new association with the above title. Although the Medico-Chirurgical Society affirmed generally the principles of the registration proposed by its committee, and granted a sum of money to carrry out the scheme, it was, nevertheless, strongly recommended by that committee, in consideration of the fact of a dissentient minority within the Society, that the scheme should be resigned by the Medico-Chirurgical Society, and organised as a new undertaking. In consequence of this recommendation, which was unanimously agreed to, a number of members of the Medico-Chirurgical Society met together on the 1st of May, and constituted the new association, which now bears the above title, and the progress of which, we trust in future to record. The following gentlemen have been named office-bearers.

President—Dr Alison.
Vice-Presidents—Drs Christison and Begbie.
Treasurer—Dr John Taylor.
Secretaries and Registrars—Dr W. T. Gairdner, and Dr J. W. Begbie.
Councillors—Drs Maclagan, Seller, Newbigging, W. Robertson, and R. J. Mackenzie.

The objects of the Medico-Statistical Association have been defined at a subsequent meeting, to be the recording of pathological facts according to a fixed plan, and by the associated efforts of members and others who may receive the sanction of the council. It is proposed that the registration of causes of death, and the other principal morbid phenomena in fatal cases of disease, shall constitute an important part of its proceedings, and form a central inquiry and permanent bond of union for the Association; while other questions of interest to the practitioner and pathologist, may from time to time be superadded, and form special subjects of inquiry. A schedule has, accordingly, been drawn up and printed, for the registration of deaths, keeping in view, namely, the principles enunciated in Dr W. T. Gairdner's paper on this subject, in the April Number of the *Monthly Journal* (p. 293), and subsequently sanctioned by the Committee of the Medico-Chirurgical Society. The membership of the Association is, in the meantime, restricted to medical practitioners in Edinburgh. It is proposed to hold quarterly meetings, of which the first will be held in July next.

EXTRAORDINARY DISCLOSURES.

The London Medical Journals have long and perseveringly accused us of "personality" in regard to our surgical brethren of their metropolis; and upon one occasion we certainly were guilty of it. This was when an attempt had been made to foist upon us, as a new and profitable improvement, the rejected absurdity of proposing to remedy incurable disease of the hip-joint by cutting out a part of the bones affected. As the gentleman who was most active in advocating this procedure represented himself as recently house-surgeon of the hospital where he had witnessed its performance, we expressed our fears that his experience would not realise the sanguine expectations of youth. Instantly there arose a howl of complaint,—as when the petulant yelp of some junior in a kennel is caught up by all the pack,—which has ever since been prolonged and reiterated in every discordant note of senseless rage. To our readers we may appeal for confirmation of the fact, that there never has been afforded

by us any other pretext which admitted of being twisted into a ground for the charge of personality. It is true that we have not hesitated to express our sentiments in regard to published facts and opinions; and have not been deterred from stating what we believed to be the truth by the position or character of the authors whose works have been submitted to our judgment. If unsound pathology, bad practice, and results worthy of such foundations, have elicited condemnation on just grounds, it is plain that the blame should not rest upon us. But it really seems as if the true nature of various doctrines communicated to the profession were not perceived until reflected from our northern mirror; and that thus the odium of the folly or mischief exposed is attributed to us. For instance, if we had said that puncturing the bladder from inability to pass the catheter was so frequent in London that one surgeon of an hospital could produce forty cases of its performance—"twenty-four of them being in his own practice;" or that another gentleman, who had been professor of surgery in both University and King's College, maintained that attempting to *force* the catheter through a stricture was justifiable and safe, "when properly performed," "what he wished to convey by the operation being properly performed, was this: that if, upon trying to urge the catheter, the urethra itself should give way, and be perforated, then that the proceeding should be abandoned;" or that this same surgeon, in a private case, did attempt to force a catheter through the stricture until "the urethra gave way," then cut into the perinæum in search of the canal, but without the "urethra being struck," and lastly punctured the bladder from the rectum; or that the same gentleman had "twice witnessed, in the hands of a very able surgeon, the bladder missed in the attempt to puncture it above the pubes;" or if we had alleged that many surgeons in London seemed to think having occasion to puncture the bladder five or six times in the course of their practice no subject of shame or reproach, then, indeed, we might have been charged with calumny of the deepest dye. But it appears that upon the evening of the 13th of April last all that has been said, and a great deal more to the same effect, was publicly stated at a meeting of the Royal Medico-Chirurgical Society, and has been unscrupulously exposed to professional comment by the very journals which accuse us of hostility to our brethren of London.

ALOÏN FROM SOCOTORINE ALOES.

The Messrs Smith, the discoverers of aloïn, inform us that they have now succeeded in obtaining it from Socotorine aloes, as well as from the Barbadoes variety. It was much longer in crystalising, but did so at last. When the impure product is re-crystalised from rectified spirit, it presents precisely the same appearance as the purified crystals from Barbadoes aloes, and seems to be identical with the aloïn obtained from that substance.

QUALIFICATIONS OF MILITARY SURGEONS.

In the Regulations of the Dublin University relative to the Diploma of Surgery, the following courses of lectures and of clinical study are recommended to Students intending to qualify for the public service in the Medical Departments of the Army, Navy, and Ordnance:—Ophthalmic Surgery, Military Surgery, Pathological Anatomy, Comparative Anatomy and Natural History, and attendance in an Hospital for the Treatment of the Insane.

The course of Military Surgery has been likewise recently recognised as qualifying for the East India Company's Service. The words of the regulation of the Hon. Company are:—"He [the student] will also be required to attend a Course of Lectures on the principles and practice of *Military Surgery*, if such a course shall be given at the place at which he has been educated."

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Erratum in May Number.—At page 455, line 30 from top, *for* ·000299 millim. *read* ·00299 millim.

INDEX.

END OF VOL. XIV.

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